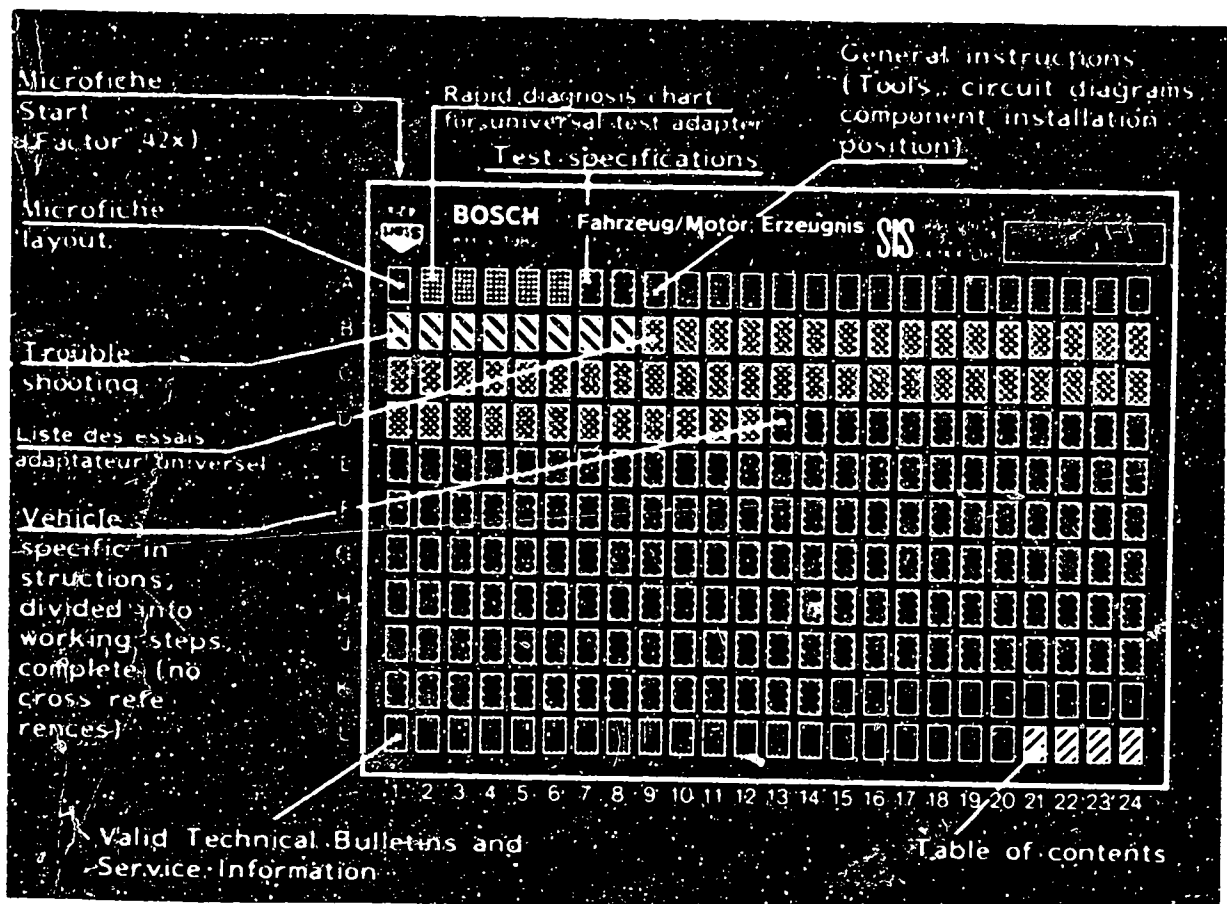


Microfiche layout



1. Read from left to right

2. Title of microfiche (appears on each coordinate)

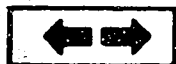
E 16	Product/assembly/test step	
	Vehicle/engine	

Coordinate

3. Limits of section



Beginning



Mid-section



End



One-page section

4. Purely vehicle-specific passages in the text are marked with a vertical bar.

5. Reference to relevant working steps in the test specifications, e.g. coordinate C6.

C 6

A1

Trouble-Shooting Plan



Rapid diagnosis chart for universal test adapter

The following rapid diagnosis chart makes it possible for the experienced L-Jetronic expert to quickly check the electrical part of the system using the universal test adapter.

The rapid diagnosis chart contains the following information:

- Switch positions on the universal test adapter
- Sequence of test steps
- Notes on how to operate the universal test adapter or other equipment
- Readings on the multimeter
- References to coordinates of the relevant detailed testing and trouble-shooting program.

If detailed information and instructions are necessary, always proceed according to the trouble-shooting program starting on Coordinate B1/B2.



Rapid diagnosis chart for universal test adapter

<u>Test step</u>	<u>Switch position</u>		<u>Remarks</u>	<u>Test specifications (reading)</u>	<u>See Coordinate for trouble-shooting</u>
	V	Ω			
1	3	-	Shift gear to neutral. Operate starting motor. Measure voltage.	<u>8 ... 15 V</u>	B11
2	4	-	Shift gear to neutral. Operate starting motor. Measure voltage	<u>8 ... 15 V</u>	B15
3	5	-	Shift gear to neutral. Operate starting motor. Measure voltage pulses with motortester.	Ignition pulses on motortester	B19
4	6	-	Ignition "ON". Measure voltage.	<u>8 ... 15 V</u>	B22
5	7	-	Ignition "ON". Measure voltage.	<u>8 ... 15 V</u>	C1
6	8	-	Ignition "ON". Measure voltage.	<u>8 ... 15 V</u>	C4
7	9	-	Ignition "ON". Measure voltage.	<u>8 ... 15 V</u>	C7
8	10	-	Ignition "ON". Measure voltage.	<u>8 ... 15 V</u>	C10
9	11	-	Ignition "ON". Deflect air-flow sensor flap. Measure voltage.	<u>8 ... 15 V</u>	C13
10	12	-	Ignition "ON". Measure voltage.	<u>8 ... 15 V</u>	C16

A3

Rapid diag. chart for universal test adpt
Fiat 132/Argenta/Spider 2000 US












A4

Rapid diag. chart for universal test adpt.
Fiat 132/Argenta/Spider 2000 US



Rapid diagnosis chart for universal test adapter

Test step	Switch position		Remarks	Test specifications (reading)	See Coordinate for trouble-shooting
	V	Ω			
11		6	Measure resistance. Deflect air-flow sensor flap.	Code no. 5 or 8 40 ... 300 Ω Code no. 21 80 ... 600 Ω	C18
12		7	Measure resistance.	Code no. 5 or 8 130 ... 260 Ω Code no. 21 260 ... 520 Ω	C20
13		8	Measure resistance.	Code no. 5 or 8 200 ... 400 Ω Code no. 21 400 ... 800 Ω	C22
14		9	Measure resistance. Accelerator in rest position	0 ... 10 Ω	D 1
15		10	Accelerator in full-load position. Measure resistance.	0 ... 10 Ω	D 3
16		11	Measure resistance.	30 Ω ... 30k Ω (depends on temperature)	D 5
17		12	Measure resistance.	30 Ω ... 30k Ω (depends on temperature)	D 7
18		13	Measure resistance.	0 ... 10 Ω	D 9
19		14	Measure resistance.	0 ... 10 Ω	D11

A5

Rapid diag. chart for universal test adpt.
Fiat 132/Argenta/Spider 2000 US



A6

Rapid diag. chart for universal test adpt.
Fiat 132/Argenta/Spider 2000 US



Idle speed

Manually-shifted transmission:
Automatic transmission (selector lever in position D and handbrake on):

800...900 min⁻¹

700...800 min⁻¹

B7

Exhaust-gas setting, CO concentration

(with engine at normal operating temperature)

Europe vehicles:
US vehicles (sensor cable disconnected):

1.5...2.5 % by vol. CO

0.5...0.7 % by vol. CO

Fuel pressure

Europe vehicles:

2.8...3.2 bar

US vehicles:

2.3...2.7 bar

Fuel pump delivery

Europe vehicles:

min. 675 cm³/30s

US vehicles:

min. 625 cm³/30s

Solenoid-operated injection valve

Electrical internal resistance: 2.0...3.0 Ω

Temperature sensors

Electrical internal resistance:

	NTC I (air)	NTC II (engine)
Ambient temperature (approx. 15-30 °C)	1.45...3.3 kΩ	1.3...3.6 kΩ
Engine at normal operating temperature (approx. 80 °C)	280...360 Ω	250...390 Ω

Start valve

Electrical internal resistance: 3.5...4.5 Ω

Auxiliary-air device

Electrical internal resistance: 40...75 Ω

B5

A7

Test specifications

Fiat 132/Argenta/Spider 2000 US



Thermo-time switch

B7

Electrical internal resistance:

	Between term. "G" + ground	Between term. "W" + ground	Between term. "G" + "W"
Ambient temperature (below 30°C)	25...40 Ω	0 Ω	25...40 Ω
Engine at normal operating temperature (above 40°C)	50...80 Ω	100...160 Ω	50...80 Ω

Air-flow sensor

B5

Electrical internal resistance

Code No. on air- flow sensor	5 or 8	21
Term. 6 to term. 9	200 ... 400 Ω	400 ... 800 Ω
Term. 6 to term. 8	130 ... 260 Ω	260 ... 520 Ω
Term. 8 to term. 9	70 ... 140 Ω	140 ... 280 Ω
Term. 6 to term. 7	40 ... 300 Ω^*	80 ... 600 Ω^*
Term. 7 to term. 8	100 ... 500 Ω^*	200 ... 1000 Ω^*

* Reading changes when air-flow sensor flap is deflected

Relay set

B5

Resistance measurement between term. 86b
(positive) and term. 85:

0 332 514 105	50...110 Ω
0 332 514 121/127	70...500 Ω

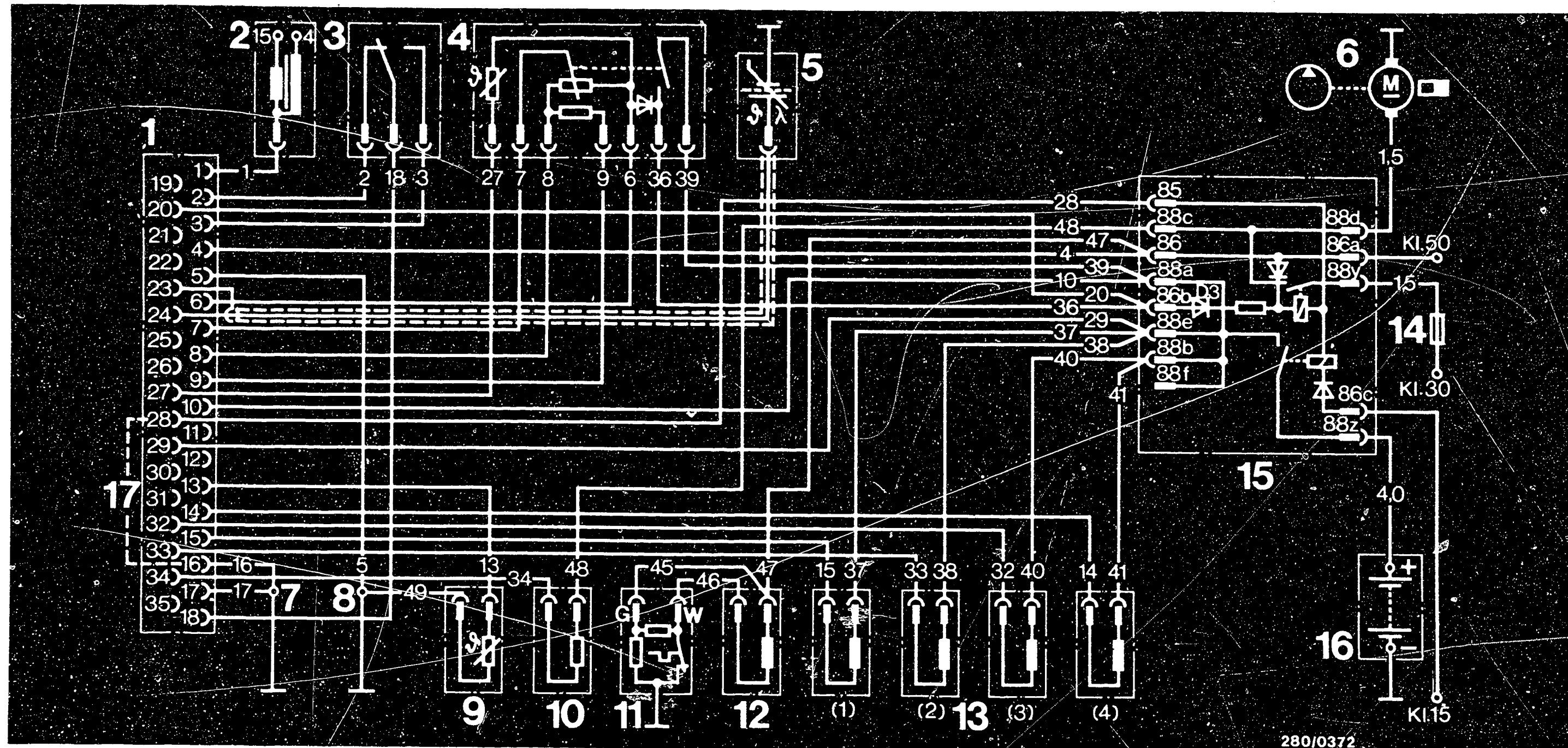
See equipment and Autodata microfiches for settings for
ignition, valve clearance and other engine data.

A8

Test specifications

Fiat 132/Argenta/Spider 2000 US





280/0372

Electrical terminal diagram of L-Jetronic

- | | | | |
|--|---|---------------------------|---|
| 1 = Multiple plug | 6 = Electric fuel pump | 10 = Auxiliary-air device | 15 = Relay set (no term. 88f or diode D 3 on ... 105) |
| 2 = Ignition coil | 7 = Ground terminal (on US vehicles output stage ground terminal) | 11 = Thermo-time switch | 16 = Battery |
| 3 = Throttle-valve switch | 8 = Ground terminal (on US vehicles electronics ground terminal) | 12 = Start valve | 17 = Bridge in control unit |
| 4 = Air-flow sensor | 9 = Temperature sensor II | 13 = Injection valves | |
| 5 = Lambda sensor (only for US vehicles) | | 14 = Pump fuse | |

A9

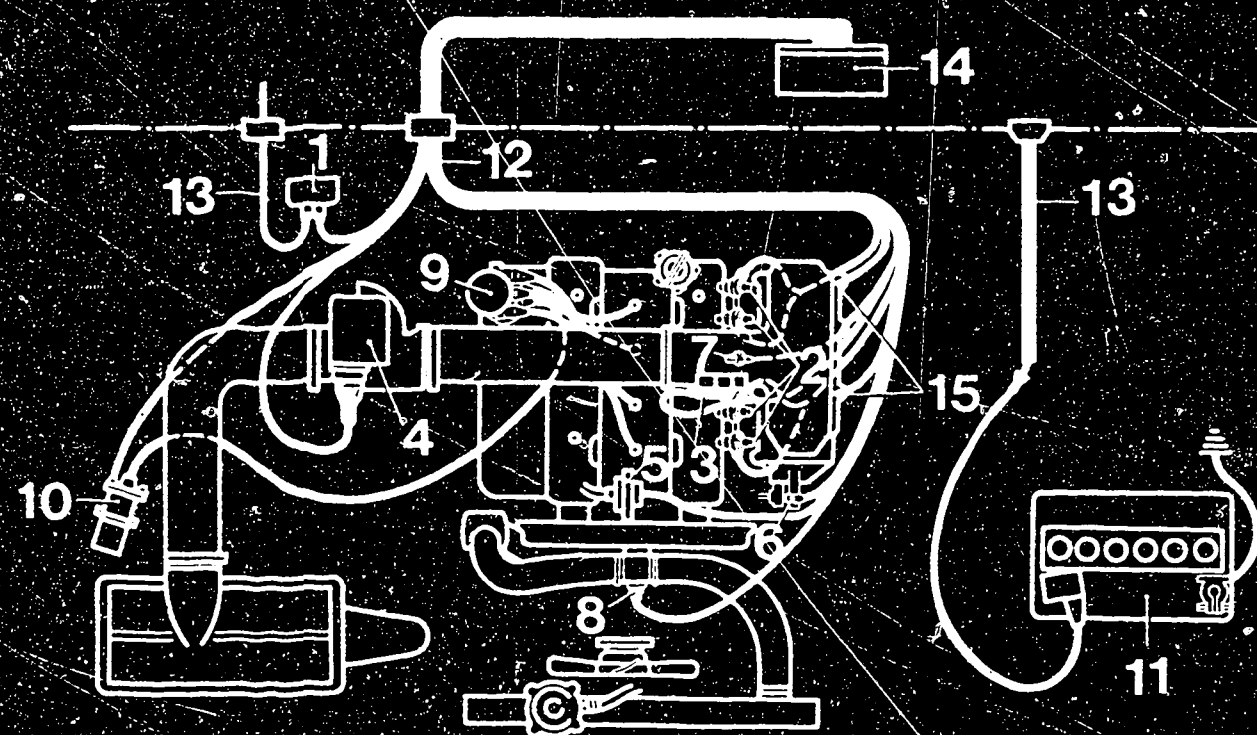
Electrical terminal diagram
Fiat 132/Argenta/Spider 2000 US



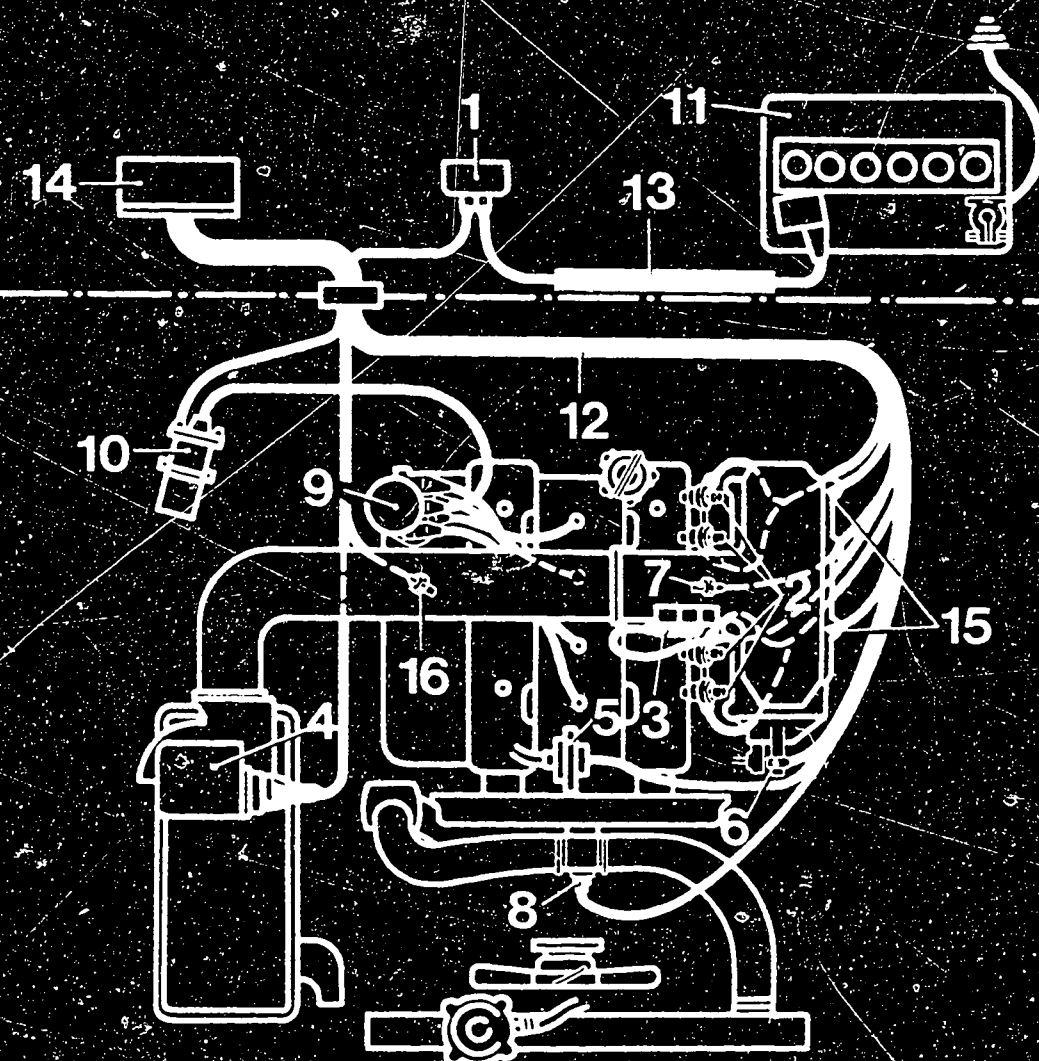
A10

Electrical terminal diagram
Fiat 132/Argenta/Spider 2000 US





280/0019



280/0092

Fiat 132/Argenta

Fiat Spider 2000 US

Electrical wiring diagram of L-Jetronic and arrangement of individual components

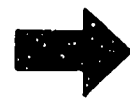
- | | |
|---------------------------|---------------------------|
| 1 = Relay set | 6 = Start valve |
| 2 = Injection valves | 7 = Thermo-time switch |
| 3 = Throttle-valve switch | 8 = Temperature sensor II |
| 4 = Air-flow sensor | 9 = Ignition distributor |
| 5 = Auxiliary-air device | 10 = Ignition coil |

- | | |
|------------------------------|--------------------|
| 11 = Battery | 16 = Lambda sensor |
| 12 = Jetronic wiring harness | (US vehicles only) |
| 13 = Vehicle wiring harness | |
| 14 = Control unit | |
| 15 = Ground terminal | |

A11

Electrical wiring diagram

Fiat 132/Argenta/Spider 2000 US

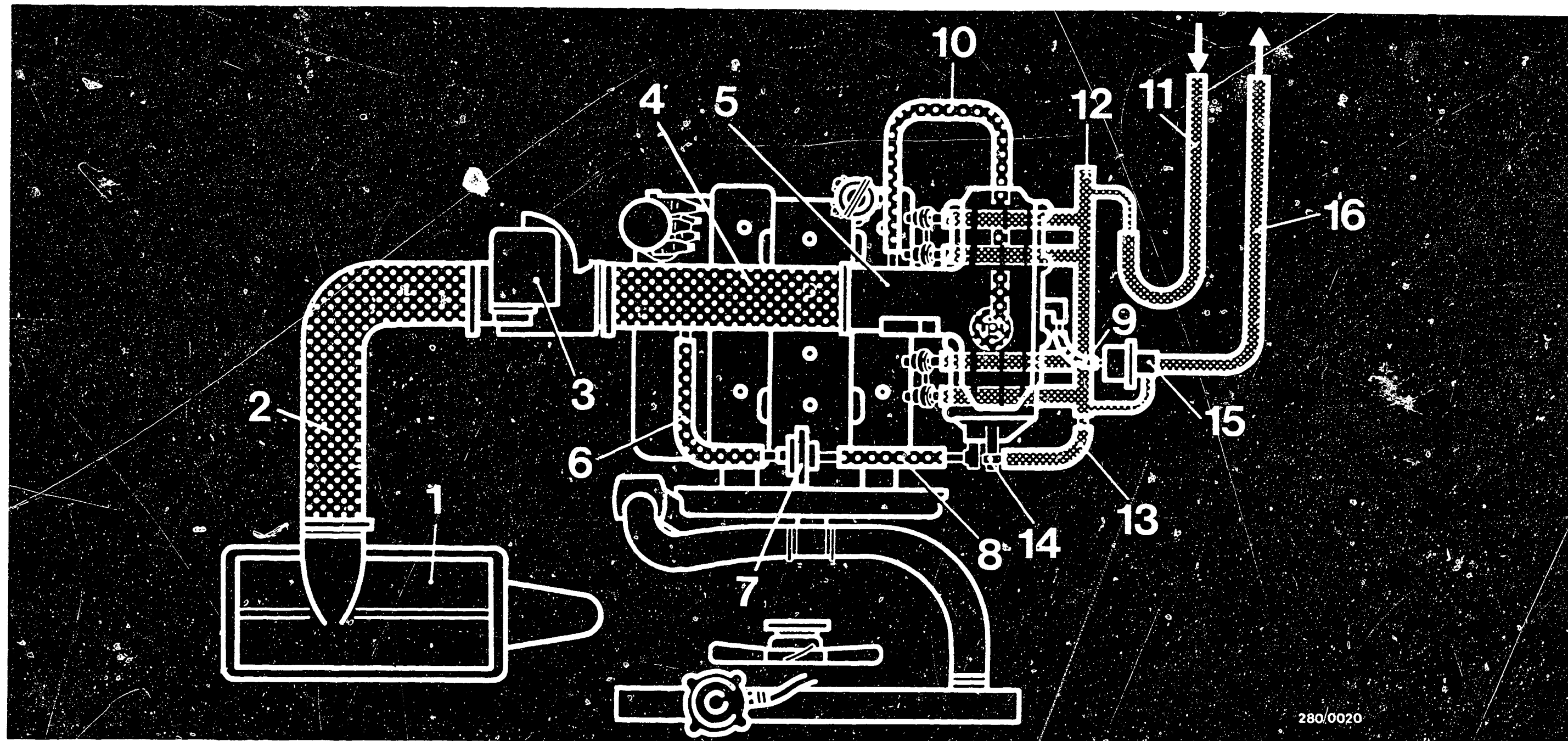


A12

Electrical wiring diagram

Fiat 132/Argenta/Spider 2000 US





280/0020

Air and fuel hoses in engine compartment of Fiat 132/Argenta (US vehicles similar)

 = air  = fuel

- 1 = Air filter
- 2 = Air hose between air filter and air-flow sensor
- 3 = Air-flow sensor

- 4 = Air hose between air-flow sensor and intake manifold
- 5 = Intake manifold with throttle valve
- 6 = Connecting hose for auxiliary-air device

- 7 = Auxiliary-air device
- 8 = Connecting hose from auxiliary-air device to intake manifold
- 9 = Connecting hose to pressure regulator
- 10 = Breather hose for oil vapors of engine

- 11 = Fuel supply line
- 12 = Fuel-distribution pipe
- 13 = Supply line to start valve
- 14 = Start valve
- 15 = Pressure regulator
- 16 = Fuel return line

A13

Diagram of air and fuel hoses
Fiat 132/Argenta/Spider 2000 US



A14

Diagram of air and fuel hoses
Fiat 132/Argenta/Spider 2000 US



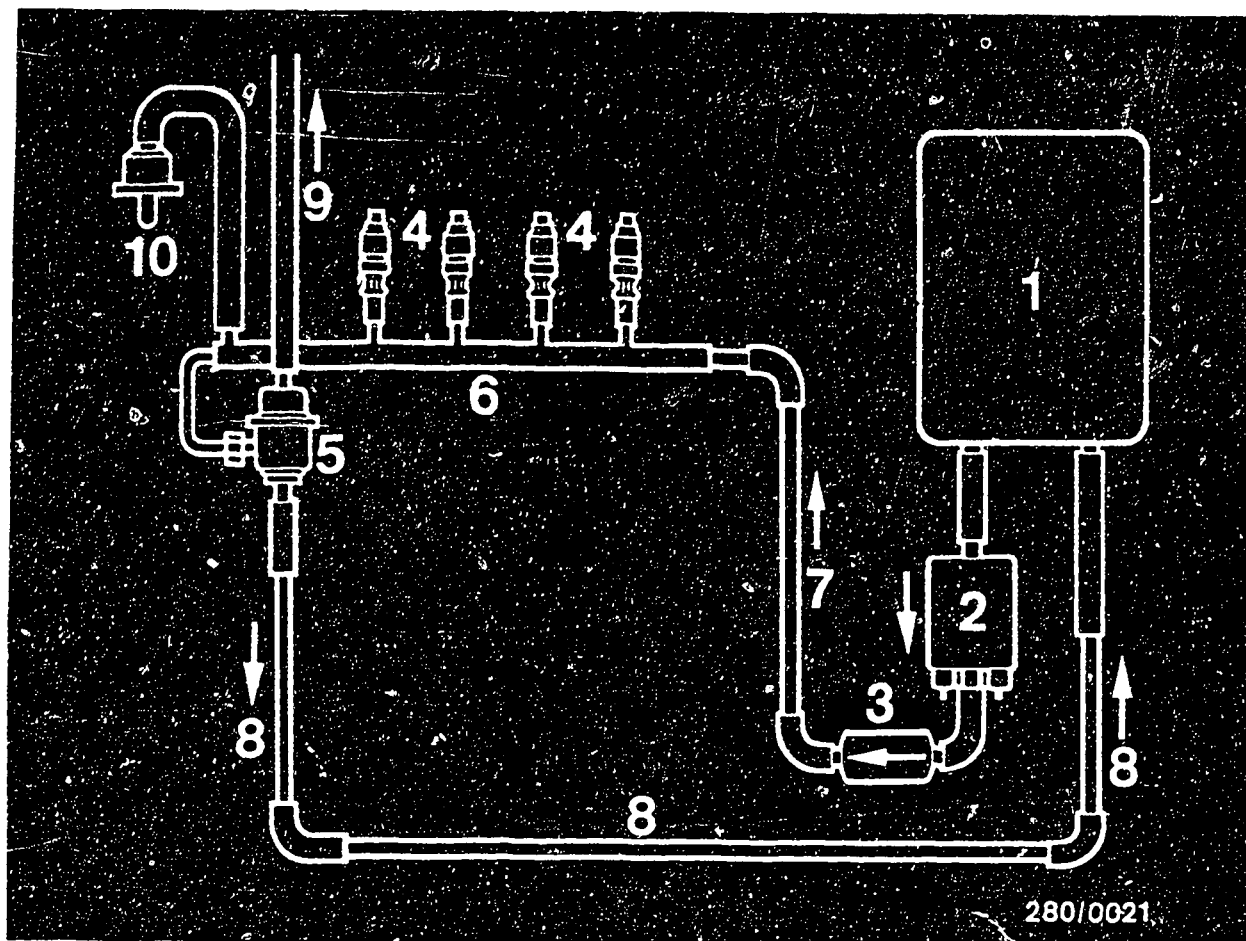


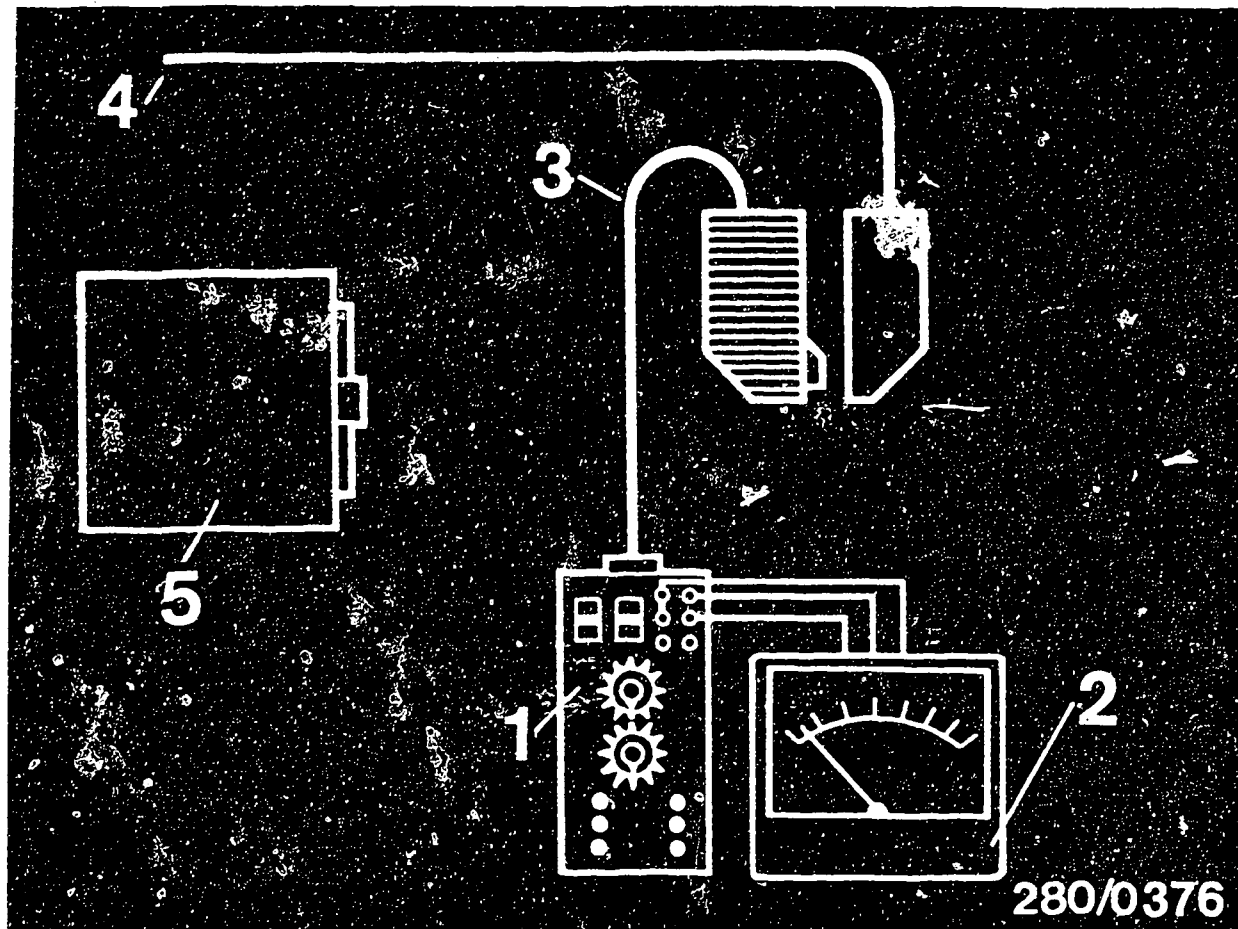
Diagram of fuel lines

- 1 = Fuel tank
- 2 = Fuel pump
- 3 = Fuel filter
- 4 = Solenoid-operated injection valves
- 5 = Pressure regulator
- 6 = Fuel-distribution pipe
- 7 = Fuel delivery line
- 8 = Fuel return line
- 9 = To intake manifold
- 10 = Start valve

Test equipment and tools

Universal test adapter	ETT 018.01	0 684 101 801
Adapter lead		1 684 463 129
Motortester	e.g. MOT 002.00	0 684 000 200
Exhaust-gas analyzer	e.g. ETT 008.00	0 684 100 800
Calibrated infrared exhaust-gas analyzer or	ETT 008.04	0 684 100 804
	ETT 008.05	0 684 100 805
Pressure gauge	Quality class 1.0 = 6 bar	
	0.1 bar graduations	1 687 231 154
Three-way line		KDJE P-100/13
Test lead		1 684 463 093
Pressure tester or		KDJE-P 100
Pressure tester (no longer available)		KDEP 1034
Clamping fixture		1 688 120 093
Assembly mandrel		1 687 931 003
Parts set		1 287 010 701
Electrics tester or multimeter	e.g. ETE 014.00	0 684 101 400
	e.g. Phillips Co. PM 2517 X	
	e.g. Miselco Co. Master 50 K	
	e.g. Chinaglia Co. Cortina	
Solenoid-operated injection valve		0 280 150 121
Tool set for fitting and removing the idle CO anti-tamper device on the air-flow sensor (e.g. No. 13 1090 from Cartool Co., Haus Schubert KG, Unterer Grasweg 88 D-8070 Ingolstadt		





- 1 = Universal test adapter
- 2 = Multimeter
- 3 = Adapter lead (L-Jetronic)
- 4 = Vehicle wiring harness
- 5 = L-Jetronic control unit

Universal test adapter with adapter lead for L-Jetronic
 (Part No. 1 684 463 129)



Instructions for use of universal test adapter with
adapter lead for L-Jetronic (Part No. 1 684 463 129)

General:

The universal test adapter is plugged onto the vehicle wiring harness with the adapter lead.

Caution:

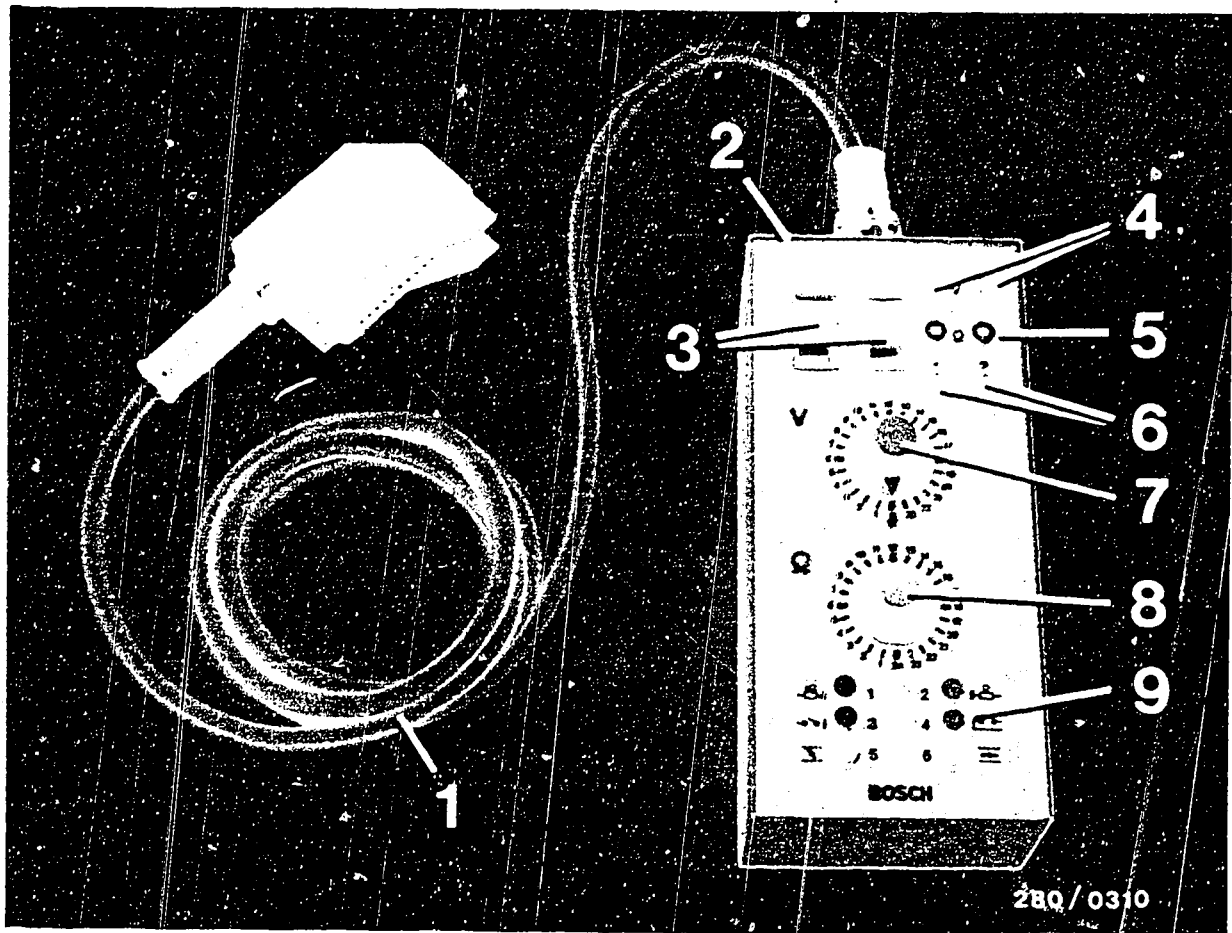
Connect and disconnect the universal test adapter only
with the ignition off!

Testing:

For testing, a multimeter with R_i min. 20 k Ω /V is connected to the test adapter.

In addition, the signal from term. 1 of the ignition coil can be measured with a motortester via the special input.

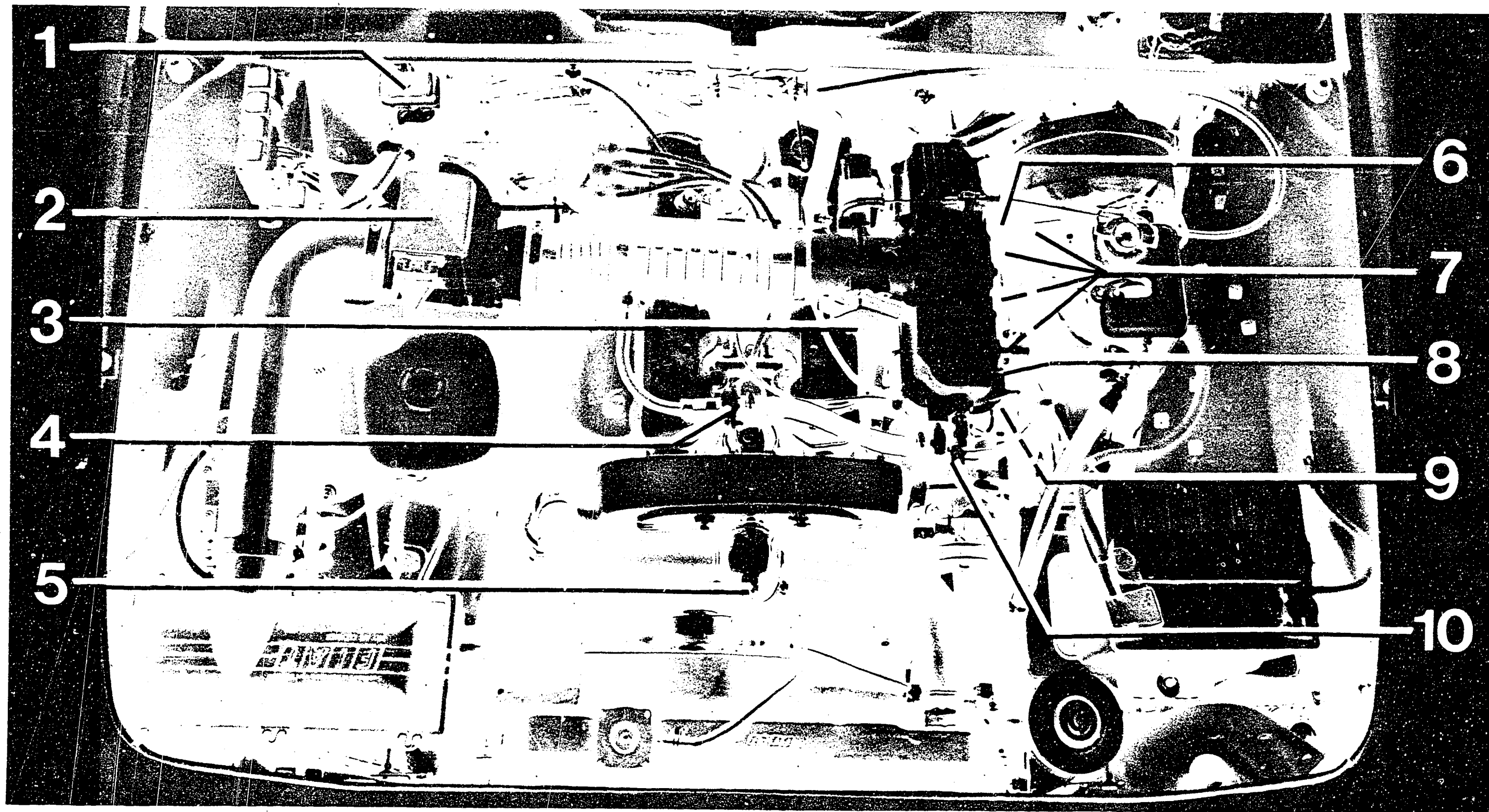




Universal adapter with adapter lead for L-Jetronic

- 1 = Adapter lead (Part No.: 1 684 463 129)
- 2 = Universal test adapter (Part No.: 0 684 101 801)
- 3 = Test wells (for motortester)
- 4 = Test sockets (for voltage measurement)
- 5 = Test sockets (for resistance measurement)
- 6 = Test sockets (not yet occupied)
- 7 = Program switch "Volt"
- 8 = Program switch "Ohm"
- 9 = Button panel (not occupied for L-Jetronic)





Installation position of components - Fiat 132 and Argenta (Fiat Spider 2000 US similar)

- 1 = Relay set
- 2 = Air-flow sensor
- 3 = Throttle-valve switch
- 4 = Auxiliary-air device

- 5 = Temperature sensor II
- 6 = Ground terminal
- 7 = Solenoid-operated injection valves
- 8 = Pressure regulator

- 9 = Thermo-time switch
- 10 = Start valve

A20

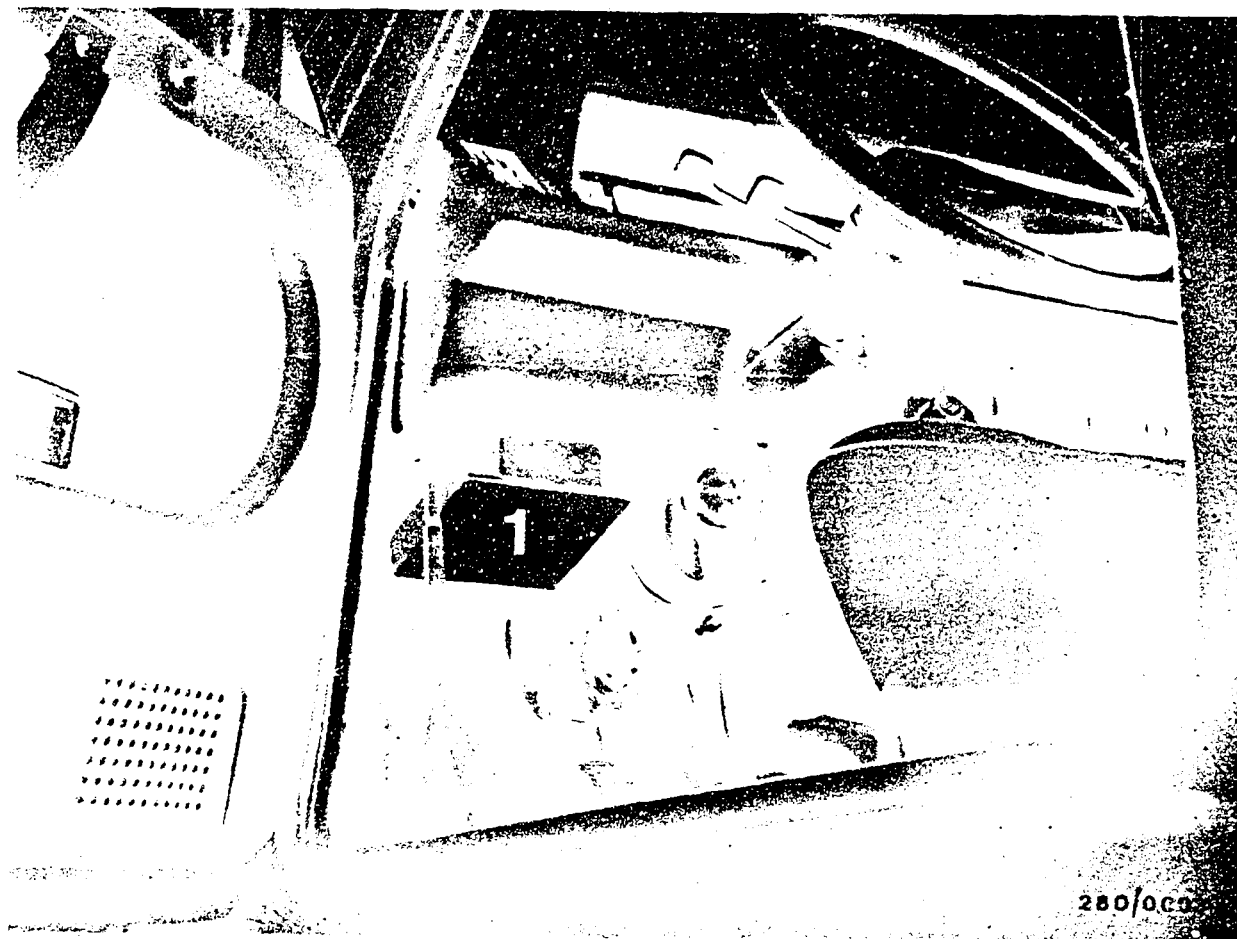
Installation position of components
Fiat 132/Argenta/Spider 2000 US



A21

Installation position of components
Fiat 132/Argenta/Spider 2000 US





1 = Installation position of control unit for Fiat 132/
Argenta
(Fiat Spider 2000 US: on the front passenger side
under the instrument panel).

A22

Installation position of components
Fiat 132/Argenta/Spider 2000 US



1 = Installation position of control unit for Fiat 132/Argenta
(In the Fiat Spider 2000 US on the front passenger side under the instrument panel).

The indications "right" and "left" apply when viewed from behind the vehicle.

Electric fuel pump and filter:	Underneath vehicle, on left-hand side, near differential.
--------------------------------	---

Electric fuel pump fuse:	Fiat 132/Argenta, behind the installation position for the loudspeaker in the instrument panel.
--------------------------	---

Different installation positions for Fiat Spider 2000 US:
Relay set and electric fuel pump fuse:

In passenger compartment, front passenger side, under instrument panel on a relay carrier.



Important general information

1. Never start engine without securely connected battery.
2. Do not use a starting aid with more than 16 V or a fast charger for starting.
3. Never disconnect battery from vehicle electrical system with engine running.
4. Disconnect battery from vehicle electrical system when fast charging.
5. Remove control unit at temperatures above 80°C (paint-drying installation).
6. Ensure that all connectors of wiring harness are properly attached.
7. Never connect or disconnect wiring-harness plug of control unit with ignition switched on.
8. When testing compression, cut the red power supply lead between battery and relay set by disconnecting the plug-in connection.
This ensures that the voltage supply for the L-Jetronic and therefore also for the injection valves is interrupted. Undesired injecting is thus prevented.
9. Remove the L-Jetronic control unit before carrying out electric welding work (e.g. spot welding).
10. When using the following trouble-shooting program it is assumed that the engine is in proper working order and that the ignition is correctly set. The electrical system must be checked and, if necessary, repaired.

In order to carry out the testing operations described in this manual and in order to assess the components, you should be familiar with the L-Jetronic and how it works. The essential points regarding the operation and construction of the L-Jetronic are described in Technical Instruction VDT-U 3/3 En.



Trouble-shooting

The following trouble-shooting programs are designed to enable workshop employees, using the universal test adapter with adapter lead (1 684 463 129) and other suitable test equipment, to quickly locate causes of trouble on the L-Jetronic. Depending on the level of knowledge and experience of the mechanic, a choice can be made between the following procedures:

- detailed step-by-step trouble-shooting for employees with little experience or practice on L-Jetronic vehicles
- pin-pointed direct trouble-shooting for trained, experienced employees who have had a great deal of practice on L-Jetronic vehicles.

Both trouble-shooting programs begin by checking the electrical part of the L-Jetronic with the aid of the universal test adapter with adapter lead. In this way, the wiring harness with the connected components is soon checked for proper electrical operation and faults are quickly located. If no fault is found using the universal test adapter with adapter lead, continue trouble-shooting with the detailed or the direct trouble-shooting program.

B3**B5****B1**

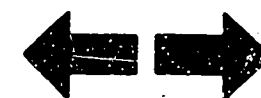
Trouble-shooting

Fiat 132/Argenta/Spider 2000 US

**B2**

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US



1. Detailed step-by-step trouble-shooting

1.1 Test with universal test adapter

This test must come at the beginning of the test program and must be performed from beginning to end (Coordinates B9 - D13).

1.2 Trouble-shooting according to customer complaints (symptoms of trouble)

The table below contains possible symptoms of trouble and gives the first coordinate of the relevant detailed trouble-shooting program in the column on the right.

The trouble-shooting program consists of logically ordered test procedures for all individual components of the L-Jetronic. If after completing the trouble-shooting program for an assumed trouble, the fault has not been detected or remedied, take a new symptom of the trouble and work through another program.

<u>Customer complaint</u> (symptom of trouble)	Universal test adapter	Coordinate
1. Engine fails to start or starts only with great difficulty	B 9	D14
2. Engine starts but then dies	B 9	E15
3. Uneven engine idle	B 9	F 7
4. Poor throttle take-up	B 9	G11
5. Engine missing under all operating conditions	B 9	H 3
6. Fuel consumption too high	B 9	J 1
7. No maximum engine power	B 9	J19
8. CO concentration at idle too high or too low	B 9	K11

B3

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US

**B4**

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US



2. Pin-pointed direct trouble-shooting

2.1 Test with universal test adapter with system adapter lead

The test with the universal test adapter must come at the beginning of the test program and must be performed from beginning to end (see Coordinates B 9 -D13).

2.2 Trouble-shooting according to customer complaints

The table below contains various symptoms of trouble with several possible causes of the trouble in each case. The Coordinate reference field indicates the first coordinate of the test procedure for the respective L-Jetronic component. If, after testing the individual components, the fault has not been detected or remedied, choose a new symptom of the trouble.

Customer complaint (symptom of trouble)

1. Engine fails to start or starts only with great difficulty
2. Engine starts but then dies
3. Uneven engine idle, idle speed incorrect
4. Poor throttle take-up
5. Engine missing under all operating conditions
6. Fuel consumption too high
7. No maximum engine power
8. CO concentration at idle too high or too low
- Cause (component fault)

B9	B9	B9	B9	B9	B9	B9	B9	Universal test adapter
D16				H5				Relay set defective
D16								Electric fuel pump not operating
E7	F1		G13					Auxiliary-air device not opening
		F15						Auxiliary-air device not closing
E11	F3	F19	G13	H9	J13	K7	K15	Air-flow sensor defective, noise test
	F3			H9				Pump contact in air-flow sensor defective

Continued on B 7/B 8

B5

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US



B6

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US



Customer complaint (symptom of trouble)

1. Engine fails to start or starts only with great difficulty								
2. Engine starts but then dies								
3. Uneven engine idle, idle speed incorrect								
4. Poor throttle take-up								
5. Engine missing under all operating conditions								
6. Fuel consumption too high								
7. No maximum engine power								
8. CO concentration at idle too high or too low								
Cause (component fault)								
E1								Start valve not opening
E5	E23	F13			J3		K21	Start valve leaking
E7		F11						Thermo-time switch defective
E13	F5	G5	G19			K9	K23	Air-intake system leaking
		F15	G17	H17	J11			Solenoid-operated injection valves defective; connect test lead
D18	E17	F21				J23	K15	Fuel pressure too low or zero; pressure regulator not operating
					J3		K15	Fuel pressure too high; pressure regulator not operating
				H15		K5		Fuel delivery too low
E9					J9		K21	Temperature sensor II in engine defective
		F9	G21	H17				Throttle valve not closing
						J21		Throttle valve not opening fully; full-load enrichment (control unit) defective
				H5				Poor central ground, loose contacts, faulty plug-in connections
E13	F5	G5	G19	H7		K9		Open circuit in wiring harness and plug-in connections; interference
						J21		Throttle-valve switch defective
		F9	G21		J15		K13	CO exhaust-gas setting too rich, idle adjustment; solenoid-operated air valve not switching
		F9	G21	H17			K13	CO exhaust-gas setting too lean, idle adjustment, burbling
				H15				Control unit defective

B7

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US



B8

Trouble-shooting

Fiat 132/Argenta/Spider 2000 US



Test chart for universal test adaptor with adaptor lead
(1 684 463 129)

Fiat 132/Argenta and Fiat Spider 2000 (US model)

Carefully plug the universal test adaptor onto the vehicle wiring harness. (Ignition must be off).

Only the peripherals are tested.

A multimeter for measuring voltage and resistance as well as a motortester should be connected to the universal test adaptor in order to make the readings.

The individual test steps are selected by means of two program switches (one for voltage measurements and the other for resistance measurements). Each program switch has 24 test positions but not all are occupied when testing the L-Jetronic. Be sure to follow the instructions in the test chart.

In test steps 1...10 voltages are measured during starting.

Caution: Set the multimeter to the voltage measuring range.

In test steps 11...19 resistances are measured.

Caution: Set the multimeter to the resistance measuring range. During trouble-shooting, switch off ignition and disconnect multiple plug from adaptor lead.

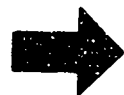
Test specifications and operating instructions for the universal test adaptor are given in the following test chart.

Fiat 132/Argenta:

The control unit is located in the passenger compartment, on the driver's side, left of the steering column. It is fastened in position by three screws.

Fiat Spider 2000 US

The control unit is located on the front passenger's side under the instrument panel.



Requirements for correct test procedure

1. Start testing at test step 1.
2. The order of the test steps must be kept to. The trouble-shooting instructions carry on in each case from the trouble-shooting instructions given for the previous test step.
Example:
If the ground connection term. 28 for the relay set is tested in test step 1, this test is not repeated in the following test steps.
3. If an incorrect reading is indicated for a test step, the test step in question must be repeated after the fault has been remedied.



Note:

In the following test steps a white border in the "Operation" column indicates which operation has to be changed in comparison with the preceding test step.

Test step 1

Operation		Reading	Testing
Program switch position "V":	3	on multimeter	Component: Relay set Starting motor term. 50
Program switch position "Ω":	- *	8...15 V	
Measuring equipment: Multimeter (Volt range)		read off.	Operation:
Measuring range: 0...15 V			Starting signal
Connection: Test sockets red (positive) and black			Malfunction:
Operation in vehicle:			No voltage reading
Ignition "ON" and start engine			

Trouble-shooting:

* Switch position not specified

For all voltage measurements:

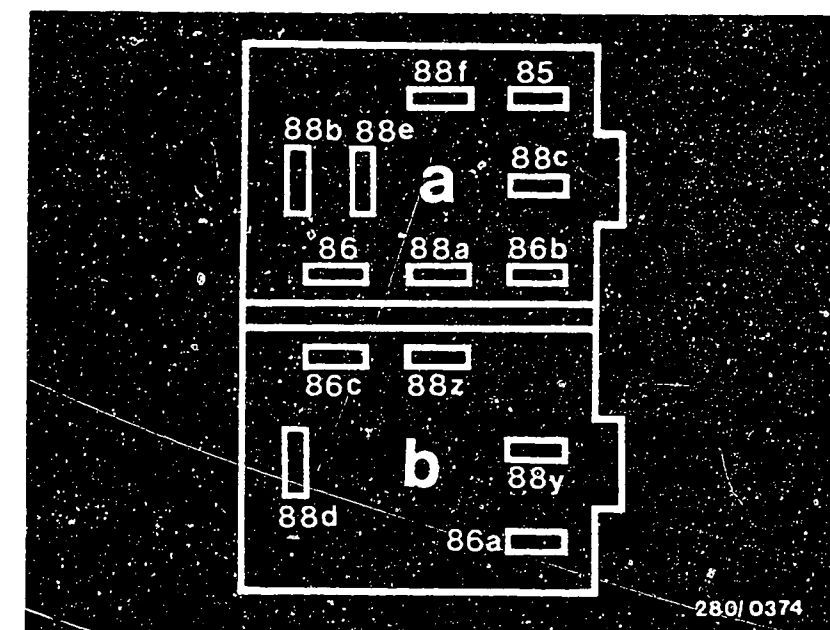
1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on B 13/14



Top view of connection base (viewed from below)

Relay set

0 332 514 121 ... 127:

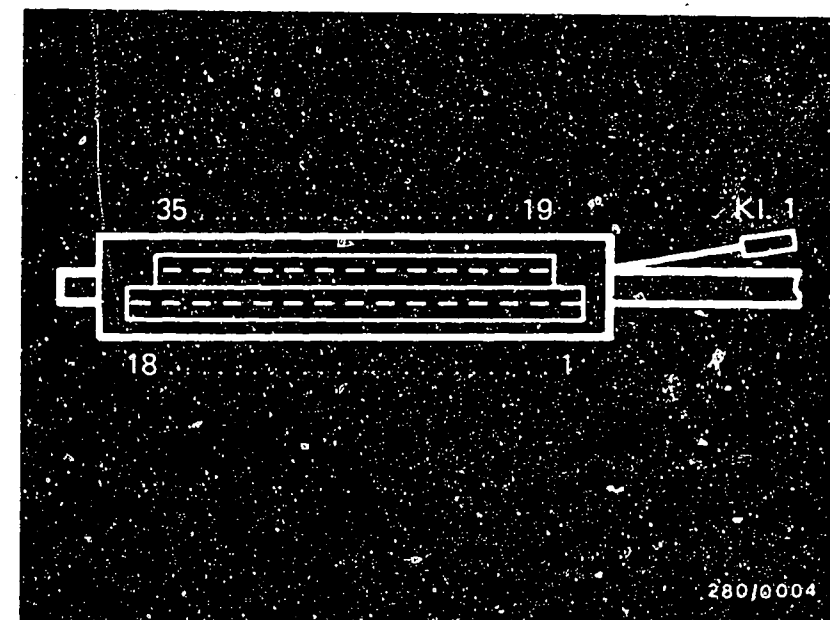
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105.

Top view of multiple plug

Kl.1 = Terminal 1



B 11

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



B 12

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 1 (continued)

Voltage reading below 8 V:

Battery insufficiently charged or high voltage drops.

No voltage reading:

1. Voltage present at relay set term. 86a? If no voltage, check lead to starting motor term. 50.

Test ground connection from multiple plug term. 5 to ground terminal.

2. Voltage present at relay set term. 86? If no voltage, replace relay set.

3. Test lead from relay set term. 86 to multiple plug term. 4.

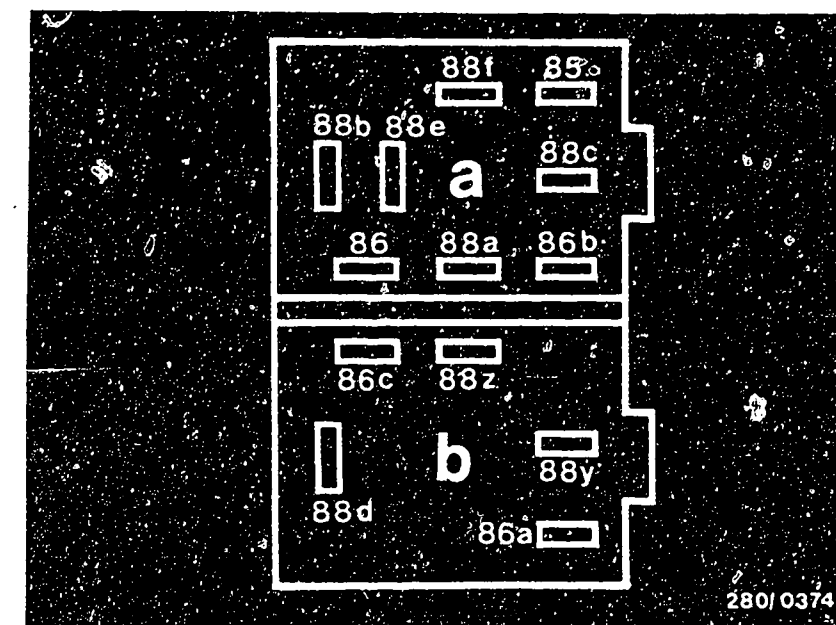
Eliminate contact resistances at the plug-in connections.

Installation position of components:

Relay set: On right-hand side on firewall

Ground terminal: On left-hand side on intake manifold diagonally above the pressure regulator

Control unit: In passenger compartment, on driver's side, left of steering column



Top view of connection base
(viewed from below)

Relay set

0 332 514 121 ... 127:

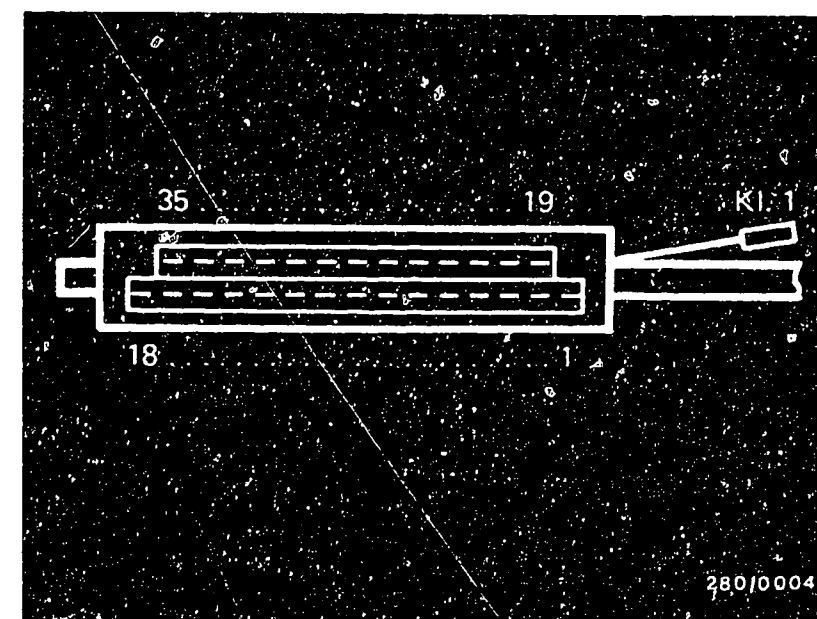
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105.

Top view of multiple plug

Kl.1 = Terminal 1



B13

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



B14

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 2		
Operation	Reading	Testing
Program switch position "V": 4	on multimeter 8 ... 15 V	Component: Auxiliary-air device, Relay set
Program switch position "Ω": -	read off.	
Measuring equipment: Multimeter (Volt range)		Operation: Voltage supply
Measuring range: 0 ... 15 V		
Connection: Test sockets red (positive) and black		
Operation in vehicle: Ignition "ON" and start engine		Malfunction: No reading

Trouble-shooting

For all voltage measurements:

1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

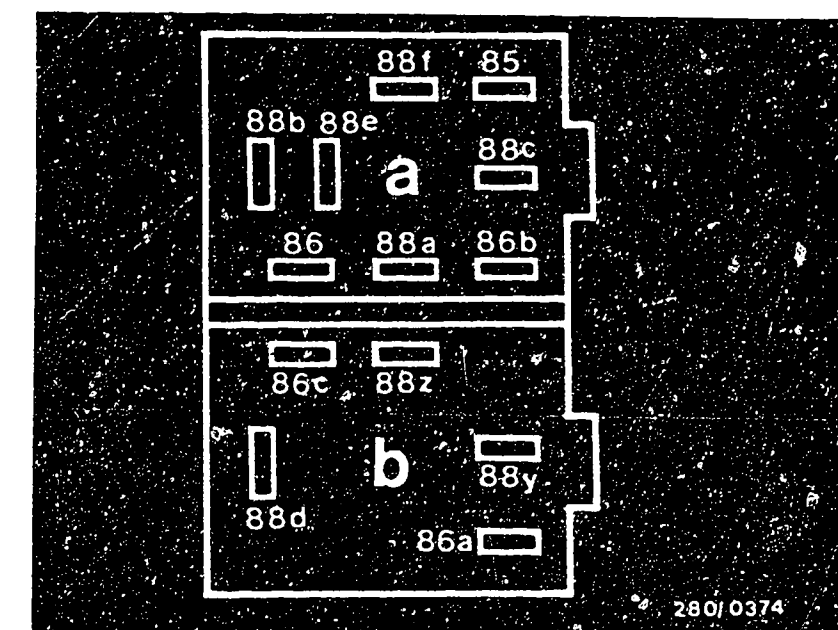
For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

1. Start engine, electric fuel pump operates.

1. Voltage present at relay set term. 88c? If no voltage, test lead 28 from relay set term. 85 to multiple plug term. 28 and multiple plug term. 16 to ground terminal. If fault not remedied, replace relay set.

Continued on B17/B18



Top view of connection base
(viewed from below)

Relay set

0 332 514 121 ... 127:

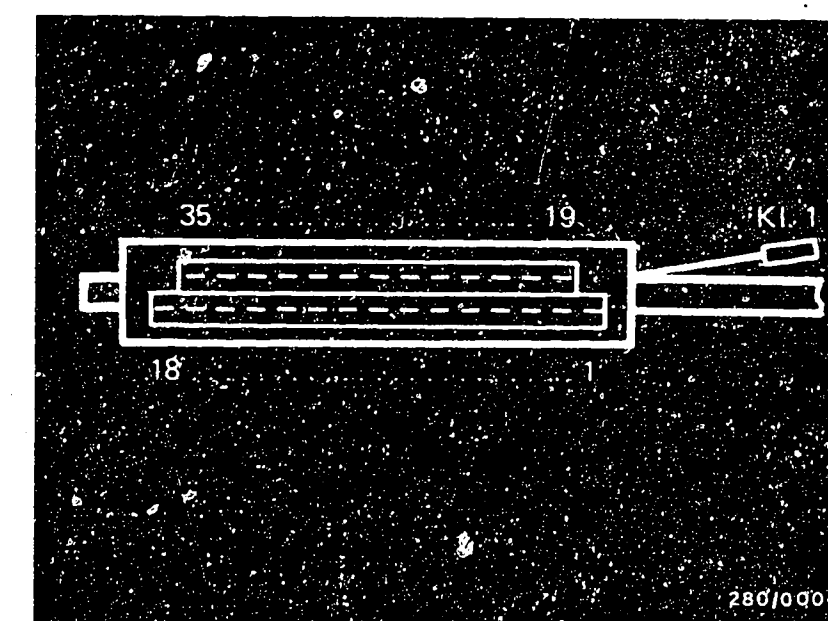
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105

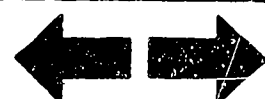
Top view of multiple plug

K1.1 = Terminal 1



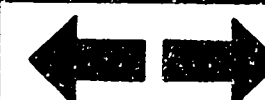
B 15

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



B 16

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 2 (continued)

2. Voltage present at auxiliary-air device term. 48? If no voltage, test lead 48 from auxiliary-air device to relay set term. 88c.
3. Test auxiliary-air device for continuity. Set value 40...75Ω. If not, replace auxiliary-air device.
4. Test lead 34 from auxiliary-air device to multiple plug term. 34.

II. Start engine, electric fuel pump does not operate.

1. Voltage present at relay set term. 88y? If no voltage, test pump fuse and voltage supply term. 30.
2. Voltage present at relay set term. 88d? If no voltage, replace relay set.
3. Test electric fuel pump and leads (ground connection).
4. Voltage present at relay set term. 88c? If no voltage, test lead 28 from relay set term. 85 to multiple plug term. 28 and multiple plug term. 16 to ground terminal. If fault not remedied, replace relay set.
5. Voltages present at auxiliary-air device term. 48? If no voltage, test lead 48 from auxiliary-air device to relay set term. 88c.
6. Test auxiliary-air device for continuity. Set value 40...75Ω. If not, replace auxiliary-air device.
7. Test lead 34 from auxiliary-air device to multiple plug term. 34.

Eliminate contact resistances at the plug-in connections.

Installation position of components

Relay set:

On right-hand side on firewall

Control unit:

On driver's side, left of steering column

Auxiliary-air device:

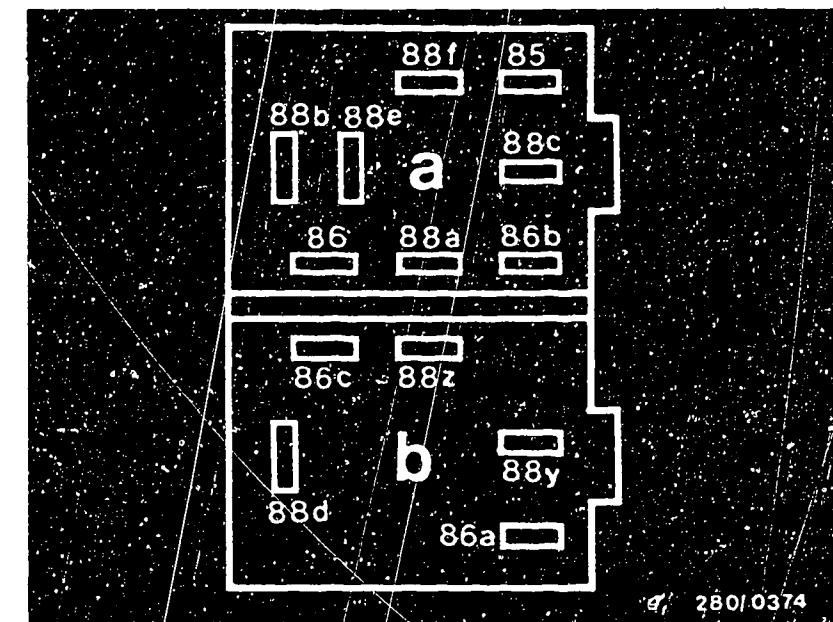
Crossways on the valve cover

Fuel pump fuse:

Behind the installation position for the loudspeaker in the instrument panel

Electric fuel pump:

Underneath vehicle on left-hand side, near differential



Top view of connection base
(viewed from below)

Relay set

0 332 514 121 ... 127:

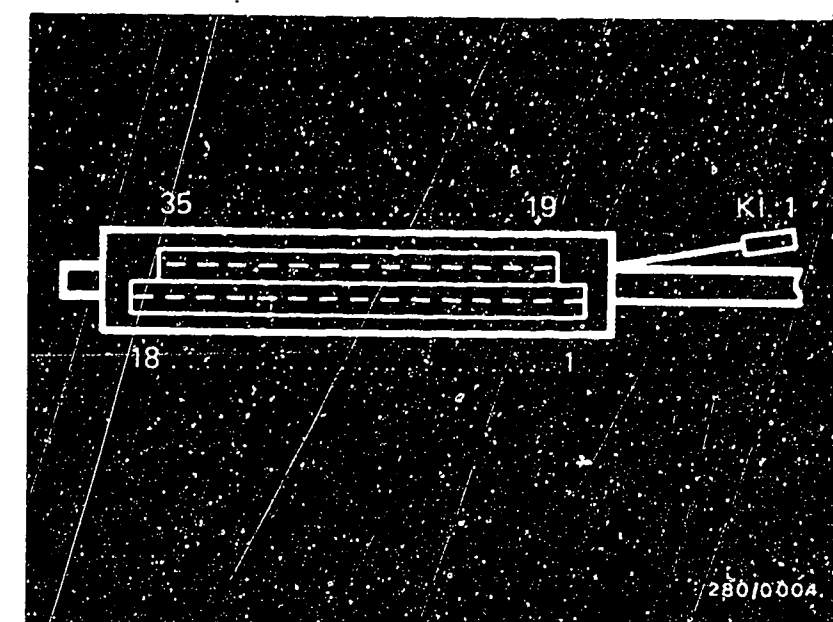
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105

Top view of multiple plug

Kl.1 = Terminal 1



B 17

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

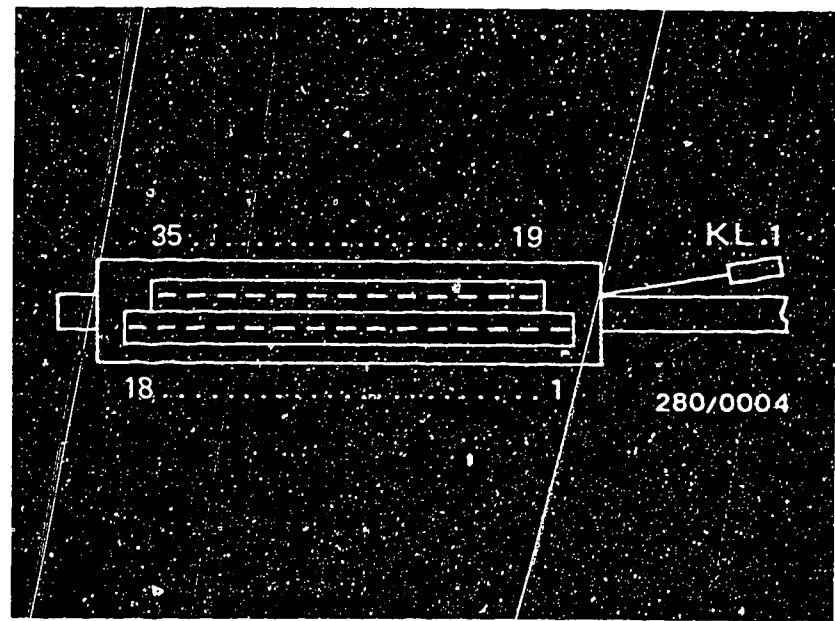


B 18

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



<u>Test step 3</u>		<u>Reading</u>	<u>Testing</u>
<u>Operation</u>			
<u>Program switch position</u> "V"	5	On ignition oscil- oscope :	<u>Component:</u> Signal from term. 1
<u>Program switch position</u> "Ω"	-	Ignition pulses	
<u>Measuring equipment:</u> Motortester			<u>Operation:</u> Triggering of control unit by the ignition
<u>Measuring range:</u> Special input. Control stick as far as it will go to the left and measuring range 20 V			
<u>Connection:</u> Test wells			<u>Malfunction:</u> No reading
<u>Operation in vehicle:</u> Ignition "ON" and start engine			



KL.1 = Terminal 1

Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V (starting)
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on B 21

B 19

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



B 20

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 3 (continued)

Lead from multiple plug term. 1 to ignition coil term. 1 dropped off? → Test and, if necessary, repair.

Voltage present at term. 1 ignition coil?

If not, check ignition system. If voltage present, test lead 1 for continuity and for short circuit to ground.

If the lead is O.K., then the trigger stage in the control unit has failed. Replace control unit.

Installation position of components:

Control unit: On driver's side, left of steering column

Ground terminal: On left-hand side on intake manifold, diagonally above the pressure regulator



Test step 4			
Operation		Reading	Testing
Program switch position "V":	6	on multimeter	Component: Relay set Voltage supply
Program switch position "Ω":	-	8 ... 15 V read off.	
Measuring equipment: Multimeter (Volt range)			Operation:
Measuring range: 0 ... 15 V			Voltage supply
Connection: Test sockets red (positive) and black			Malfunction:
Operation in vehicle: Ignition "ON"			No voltage reading

Trouble-shooting:

For all voltage measurements:

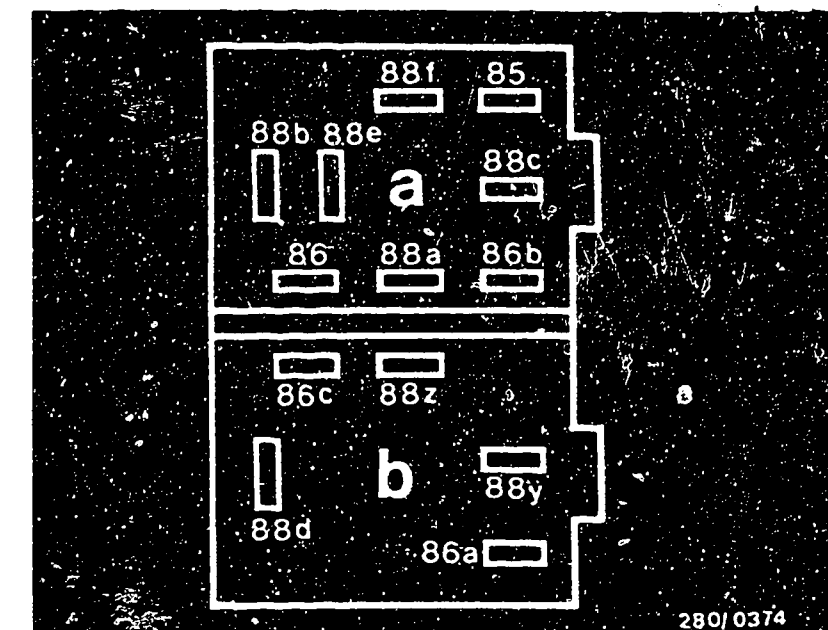
1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on B 24



Top view of connection base
(viewed from below)

Relay set

0 332 514 121 ... 127:

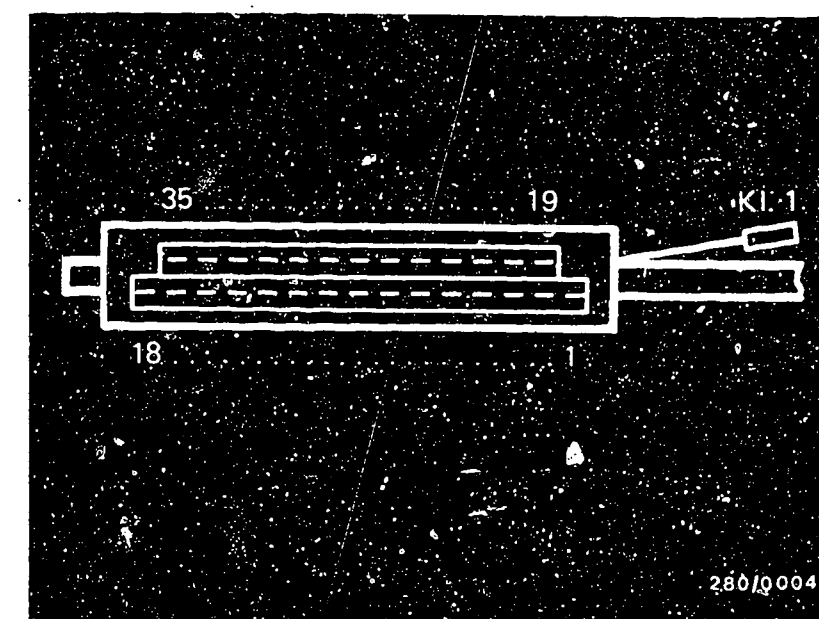
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105.

Top view of multiple plug

Kl.1 = Terminal 1



B 22

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



B 23

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 4 (continued)

Trouble-shooting

1. Voltage at relay set term. 86c? If not, check lead term. 15.
2. Voltage at relay set term. 88z? If not, test lead to battery (positive connection).
3. Voltage at relay set term. 88a? If not, replace relay set.
4. Test lead 10 from relay set term. 88a to multiple plug term. 10 for continuity.

Eliminate contact resistances at the plug-in connections.

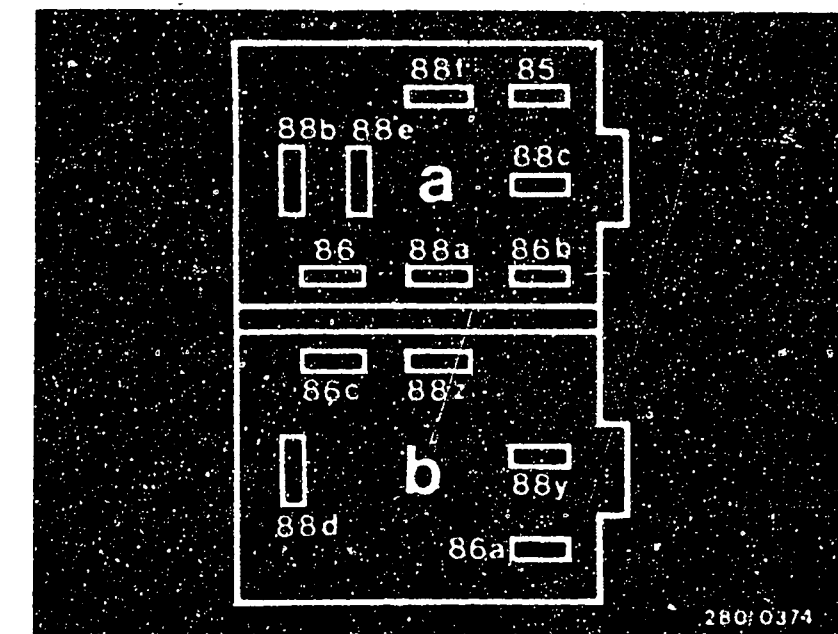
Installation position of components:

Relay set: On right-hand side on firewall.

Control unit: In passenger compartment, on driver's side, left of steering column.



Test step 5			
Operation		Reading	Testing
Program switch position "V":	7	on multimeter	Component: Control unit Relay set
Program switch position "Ω":	-	8 ... 15 V	
Measuring equipment: Multimeter (Voltrange)		read off.	Operation: Voltage supply of 1st solenoid- operated injection valve
Measuring range: 0 ... 15 V			
Connection: Test sockets red (positive) and black			
Operation in vehicle: Ignition "ON"			Malfunction: No voltage reading



Top view of connection base
(viewed from below)
Relay set
0 332 514 121 ... 127:
a = Jetronic wiring harness
b = Vehicle wiring harness
No term. 88f on 0 332 514 127

Top view of multiple plug

K1.1 = Terminal 1

Trouble-shooting:

For all voltage measurements:

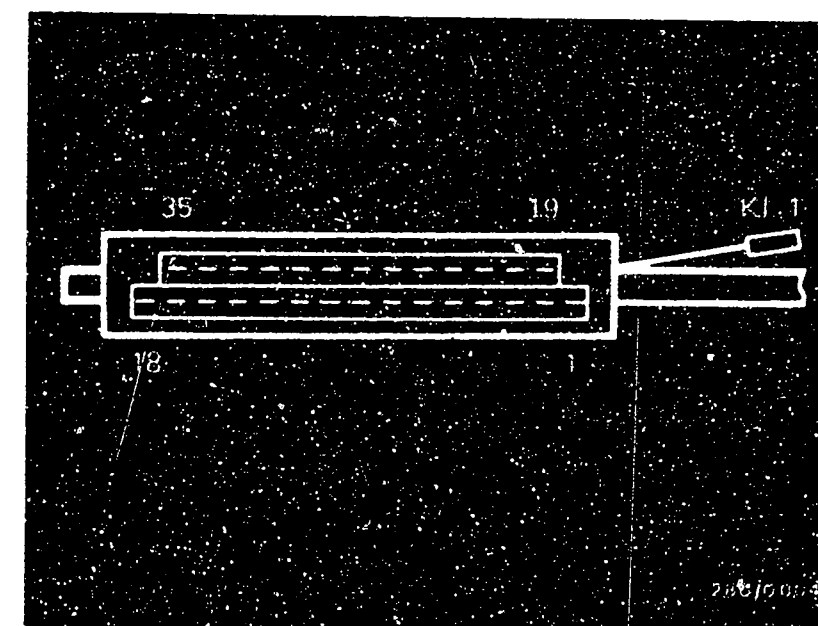
1. Set value 8 ... 15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on C 3



C1

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



C2

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 5 (continued)

Trouble-shooting

1. Voltage at relay set term. 88e? If not, replace relay set.
2. Test plug-in connection on 1st solenoid-operated injection valve. If faulty, repair plug-in connection.
3. Voltage at solenoid-operated injection valve connector term. 37? If not, test lead from solenoid-operated injection valve connector to relay set term. 88e.
4. Test lead 15 from solenoid-operated injection valve connector to multiple plug term. 15 for continuity.

Eliminate contact resistances at the plug-in connections.

Installation position of components

Relay set:

On right-hand side on firewall

Control unit:

On driver's side, left of steering column

Solenoid-operated injection valve:

On intake manifold at bottom left



Test step 6			
Operation		Reading	Testing
Program switch position "V":	8	on multimeter	Component: Control unit Relay set
Program switch position "Ω"	-	8 ... 15 V	
Measuring equipment: Multimeter (Volt range)		read off.	Operation: Voltage supply of 2nd solenoid- operated injection valve
Measuring range: 0 ... 15 V			
Connection: Test sockets red (positive) and black			
Operation in vehicle: Ignition "ON"			
			Malfunction: No voltage reading

Trouble-shooting:

For all voltage measurements:

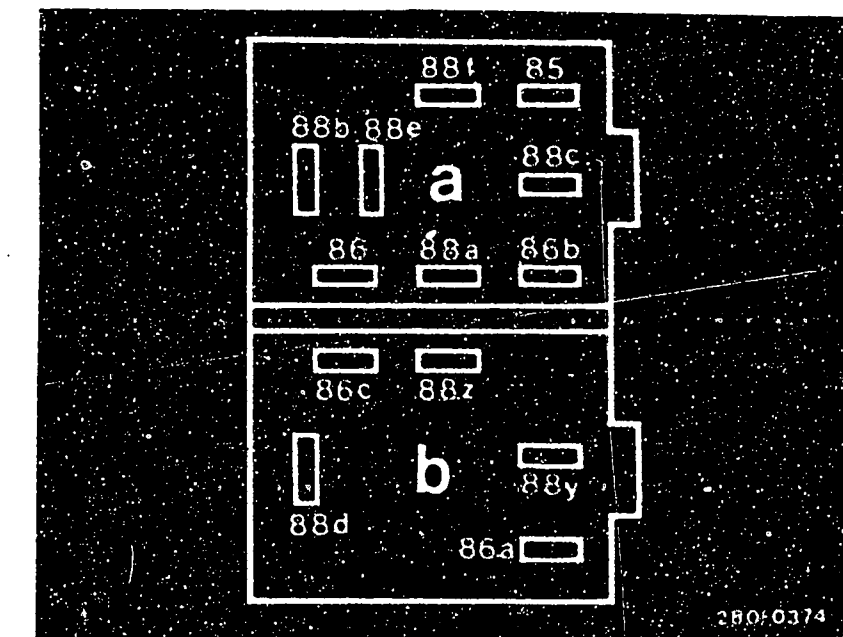
1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on C 6



Top view of connection base
(viewed from below)

Relay set

0 332 514 121 ... 127:

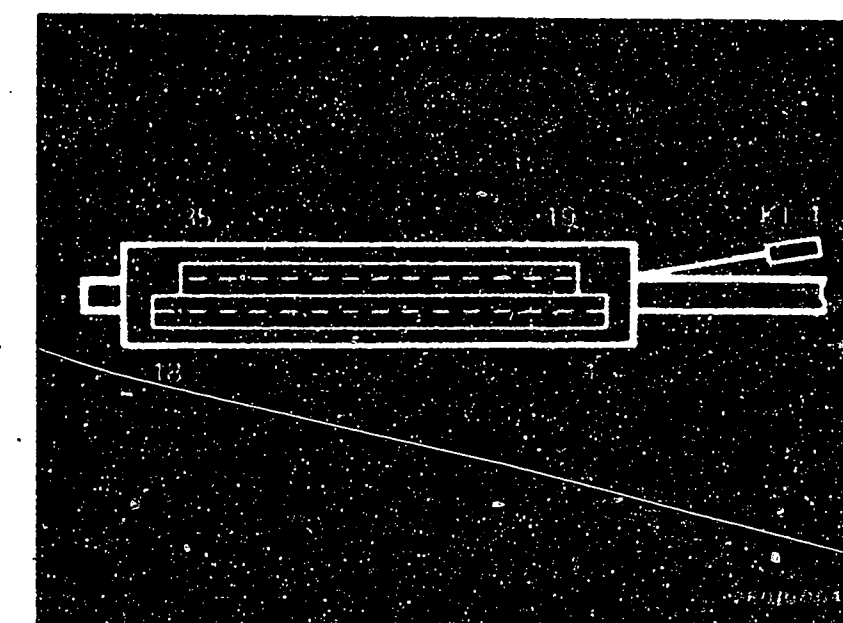
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105.

Top view of multiple plug

K1.1 = Terminal 1



C4

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US.



C5

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 6 (continued)

Trouble-shooting

1. Voltage at relay set term. 88e? If not, replace relay set.
 2. Test plug-in connection on 2nd solenoid-operated injection valve. If faulty, repair plug-in connection.
 3. Voltage at solenoid-operated injection valve connector term. 38? If not, test lead from solenoid-operated injection valve connector to relay set term. 88e.
 4. Test lead 33 from solenoid-operated injection valve connector to multiple plug term. 33 for continuity.
- Eliminate contact resistances at the plug-in connections.

Installation position of components

Relay set:

On right-hand side on firewall

Control unit:

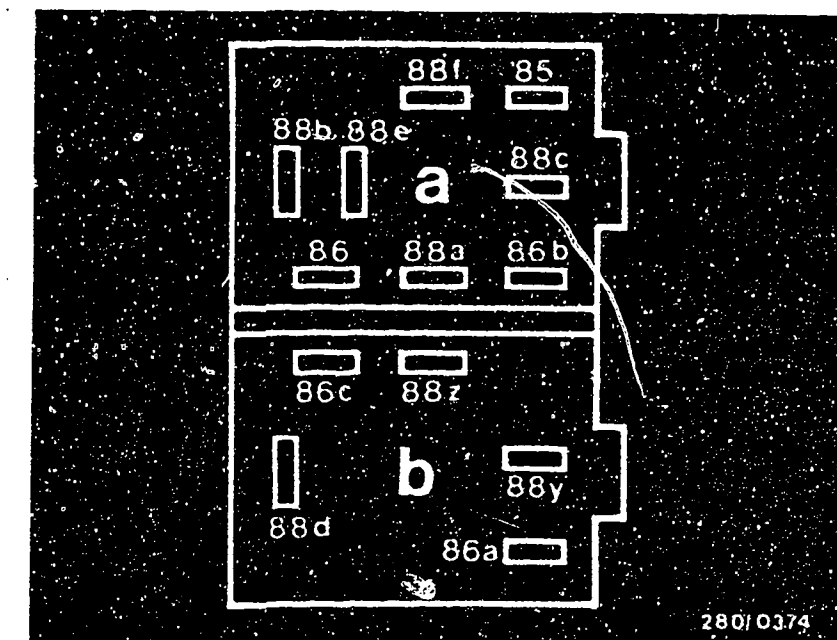
On driver's side, left of steering column

Solenoid-operated injection valve:

On intake manifold at bottom left



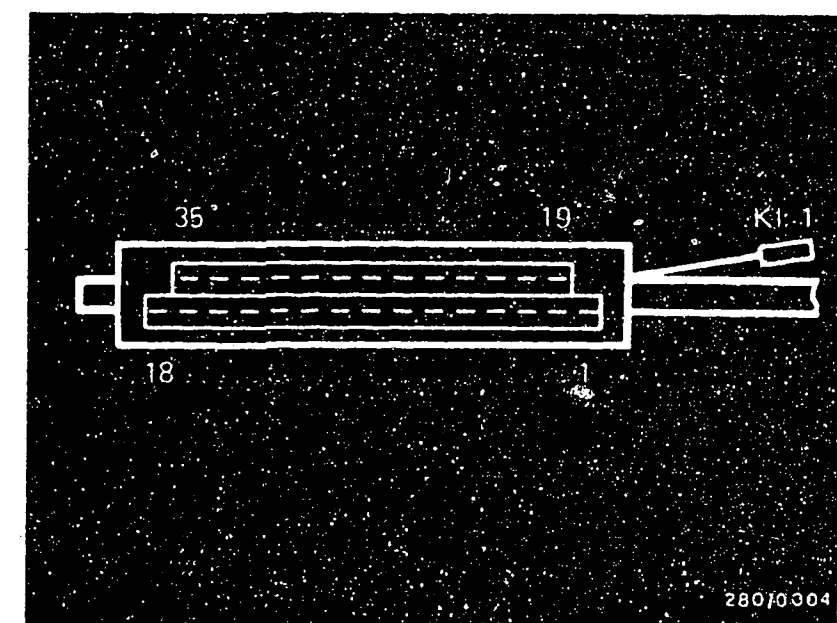
Test step 7			
Operation		Reading	Testing
Program switch position "V":	9	on multimeter	Component: Control unit Relay set
Program switch position "Ω":	-	8 ... 15 V	
Measuring equipment: Multimeter (Volt range)		read off.	Operation: Voltage supply of 3rd solenoid- operated injection valve
Measuring range: 0 ... 15 V			
Connection: Test sockets red (positive) and black			
Operation in vehicle: Ignition "ON"			Malfunction: No voltage reading



Top view of connection base
(viewed from below)
0 332 514 121 ... 127:
a = Jetronic wiring harness
b = Vehicle wiring harness
No term. 88f on 0 332 514 105.

Top view of multiple plug

K1.1 = Terminal 1



Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on C 9

C7

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



C8

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 7 (continued)

Trouble-shooting

1. Voltage at relay set term. 88b? If not, replace relay set.
 2. Test plug-in connection on 3rd solenoid-operated injection valve. If faulty, repair plug-in connection.
 3. Voltage at solenoid-operated injection valve connector term. 40? If not, test lead from solenoid-operated injection valve connector to relay set term. 88b.
 4. Test lead 32 from solenoid-operated injection valve connector to multiple plug term. 32 for continuity.
- Eliminate contact resistances at the plug-in connections.

Installation position of components

Relay set:

On right-hand side of firewall

Control unit:

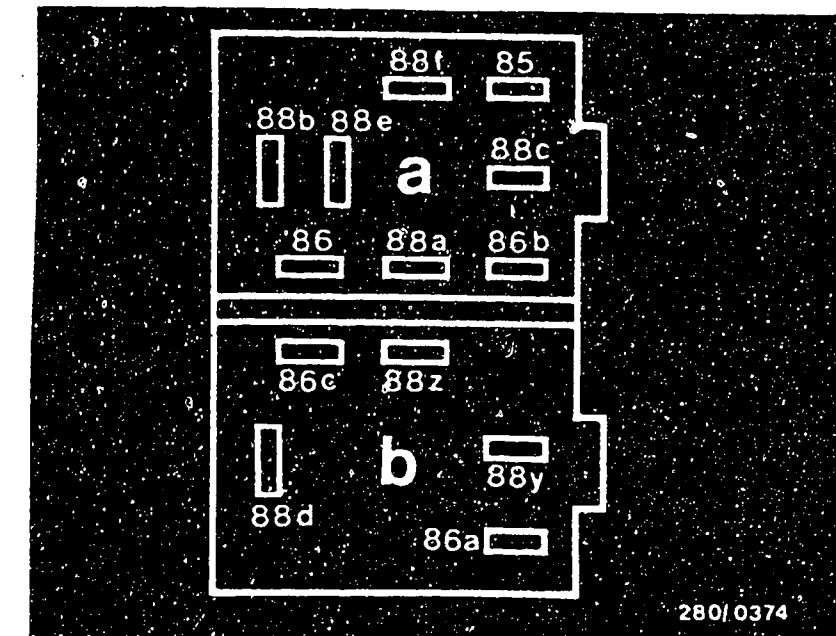
On driver's side, left of steering column

Solenoid-operated injection valve:

On intake manifold at bottom left



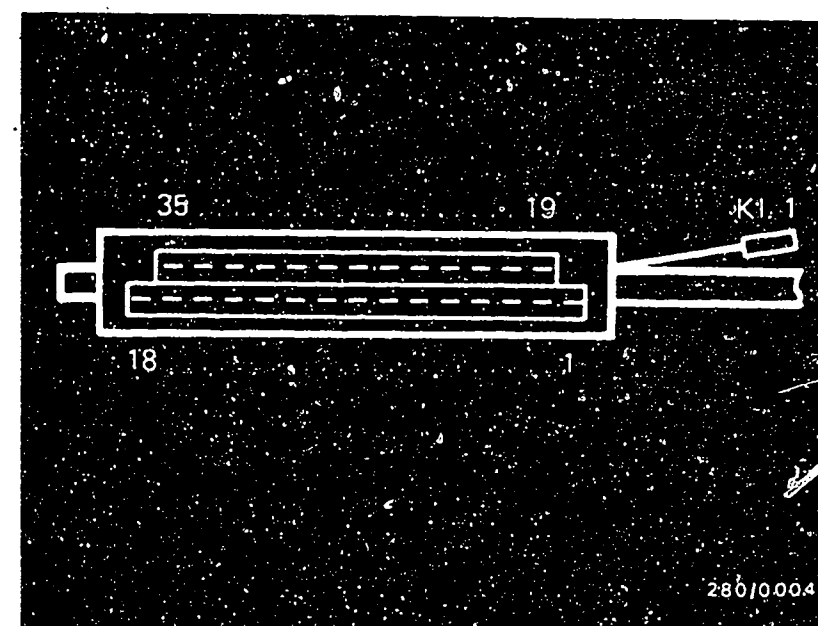
Test step 8			
Operation		Reading	Testing
Program switch position "V":	10	on multimeter 8 ... 15 V read off.	<u>Component:</u> Control unit Relay set
Program switch position "Ω":	—		<u>Operation:</u> Voltage supply of 4th solenoid- operated injection valve
Measuring equipment: Multimeter (Volt range)			
Measuring range: 0 ... 15 V			
Connection: Test sockets red (positive) and black			
Operation in vehicle: Ignition "ON"			
		<u>Malfunction:</u> No voltage reading	



Top view of connection base
(viewed from below)
Relay set
0 332 514 121 ... 127:
a = Jetronic wiring harness
b = Vehicle wiring harness
No term. 88f on 0 332 514 105

Top view of multiple plug

K1.1 = Terminal 1



Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω
Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on C 12

C 10

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



C 11

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 8 (continued)

Trouble-shooting

1. Voltage at relay set term. 88b? If not, replace relay set.
 2. Test plug-in connection on 4th solenoid-operated injection valve. If faulty, repair plug-in connection.
 3. Voltage at solenoid-operated injection valve connector term. 41? If not, test lead from solenoid-operated injection valve connector to relay set term. 88b.
 4. Test lead 14 from solenoid-operated injection valve connector to multiple plug term. 14 for continuity.
- Eliminate contact resistances at the plug-in connections

Installation position of components

Relay set:

On right-hand side on firewall

Control unit:

On driver's side, left of steering column

Solenoid operated injection valve:

On intake manifold at bottom left



Test step 9

Operation

Program switch position

11

Program switch position

-

Measuring equipment: Multimeter
(Volt range)

Measuring range: 0...15 V

Connection: Test sockets
red (positive) and black

Operation in vehicle:
Ignition "ON"
Deflect air-flow sensor flap.

Reading

on multimeter

8 ... 15 V

read off.

Testing

Component:

Pump contact in air-flow sensor
Relay set

Operation:

Voltage supply for electric
fuel pump

Malfunction:

No voltage reading

Trouble-shooting:

For all voltage measurements:

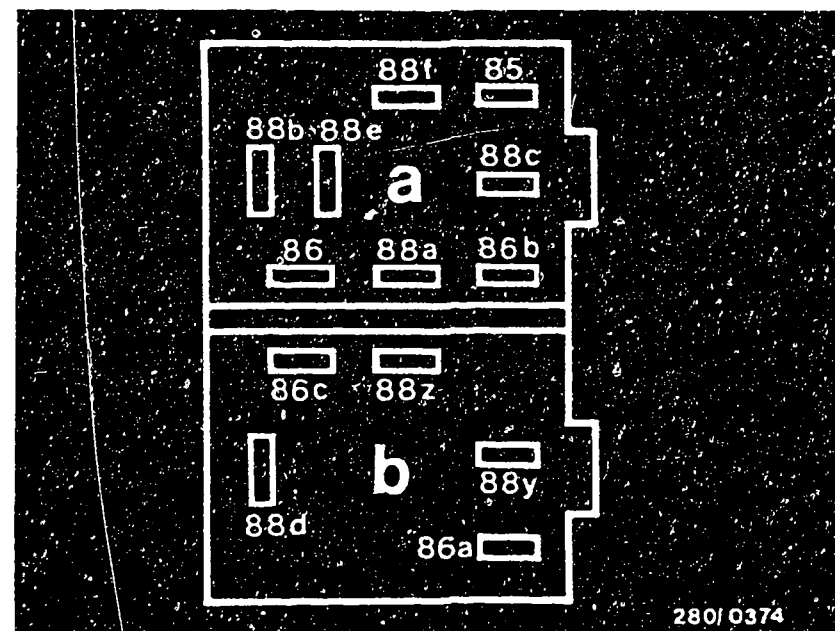
1. Set value 8...15 V (starting).
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω .

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Continued on C 15



Top view of connection base
(viewed from below)

Relay set

0 332 514 121 ... 127:

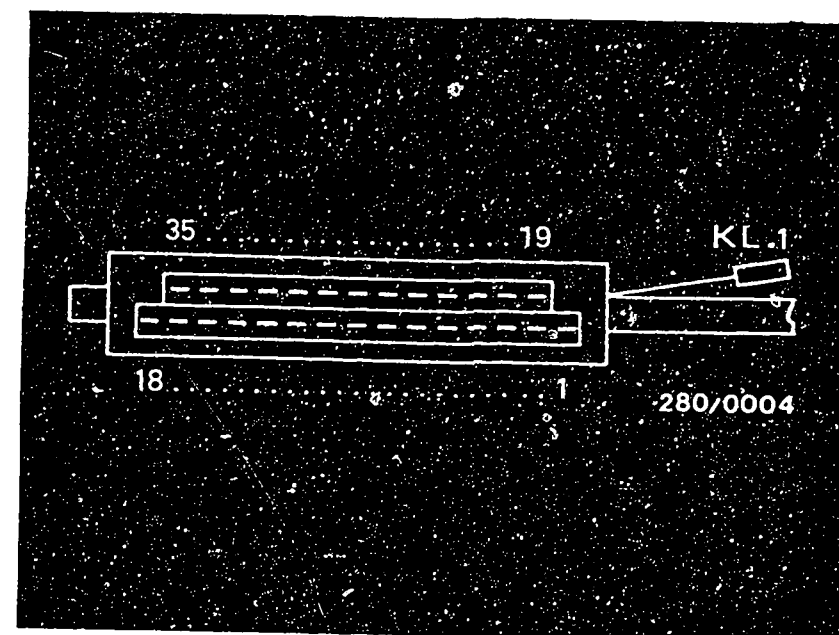
a = Jetronic wiring harness

b = Vehicle wiring harness

No term. 88f on 0 332 514 105

Top view of multiple plug

KL.1 = Terminal 1



C13

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



C14

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 9 (continued)

Trouble-shooting

1: Voltage at air-flow sensor term. 39? If not, remove plug from air-flow sensor and test lead 39.

2. Test pump contact in air-flow sensor (deflect air-flow sensor flap). Test diode in air-flow sensor between term. 6 and term. 36 (positive pole of ohmmeter to term. 6 of air-flow sensor).

Set value: approx. 0Ω (with reversed polarity $\infty\Omega$).

3. Test lead 36 between air-flow sensor and relay set.

4. Test lead 20 between control unit and relay set.

Eliminate contact resistances at the plug-in connections.

Installation position of components

Control unit:

On driver's side, left of steering column

Air-flow sensor:

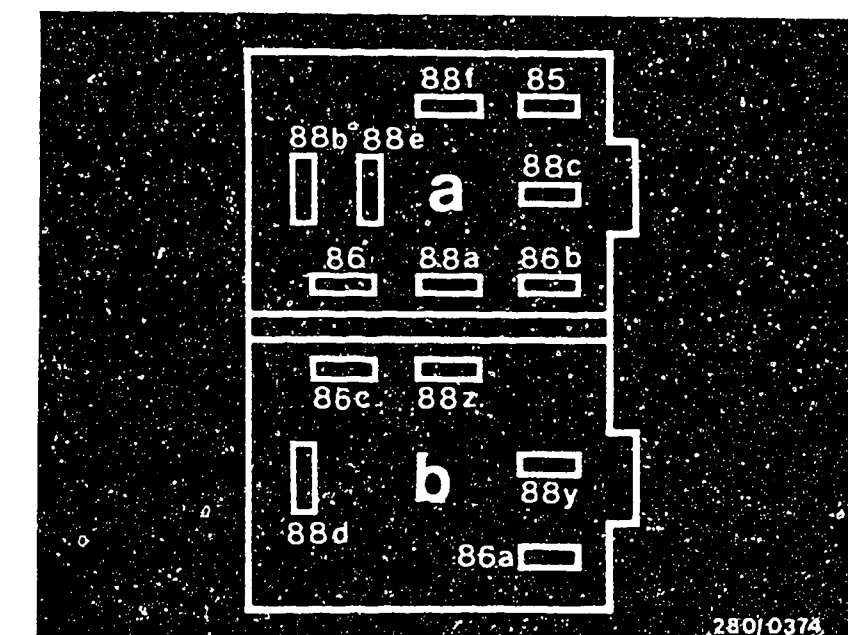
Between air filter and intake manifold

Relay set:

On right-hand side on firewall



Test step 10:			
Operation		Reading	Testing
Program switch position "V":	12	on multimeter	Component: Control unit
Program switch position "Ω":	-	8 ... 15 V	
Measuring equipment: Multimeter (Volt range)		read off.	Operation: Triggering of control unit out- put stage
Measuring range: 0...15 V			
Connection: Test sockets red (positive) and black			
Operation in vehicle: Ignition "ON"			Malfunction: No reading



Top view of connection base
(viewed from below)
Relay set
0 332 514 121 ... 127:
a = Jetronic wiring harness
b = Vehicle wiring harness
No term. 88f on 332 514 105.

Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V (starting)
2. Make measurement at the respective component connector.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary. Set value approx. 0Ω.

Important! Ignition "OFF" and ensure that good electrical contact is made when measuring.

Test lead from multiple plug term. 29 to relay set term. 88e.
Eliminate contact resistances at the plug-in connections.

Installation position of components:

Ground terminal: on left-hand side on intake manifold, near steering column

Control unit: on driver's side, left of steering column

Relay set: on right-hand side on firewall

C16

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

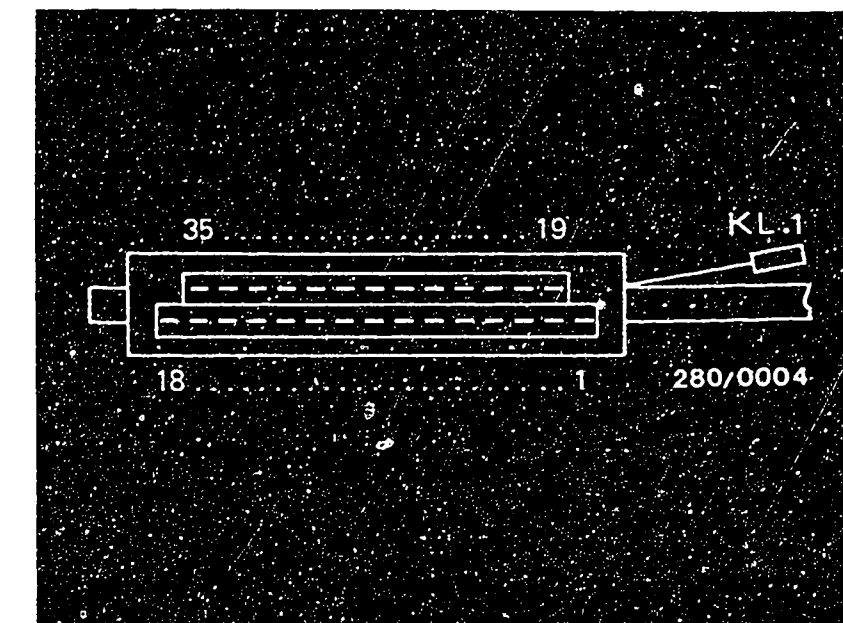


C17

Test chart for universal test adaptor
Fiat 132/Argenta/Spider US 2000



Test step: 11		
Operation	Reading	Testing
Program switch position "V":	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <div style="text-align: center;">↓</div> <div style="text-align: center;">6</div> </div> <div style="border-left: 2px solid black; height: 100px; margin-left: 10px;"></div> </div>	Component:
Program switch position "Ω":		
Measuring equipment: Multimeter (Ω range)		Operation:
Measuring range: x 10 Ω		
Connection: Test sockets blue		
Operation in vehicle: Deflect air-flow sensor flap.		Malfunction:
		Resistance outside tolerance



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0Ω):

- From multiple plug term. 7 to air-flow sensor term. 7
- From air-flow sensor term. 6 to multiple plug term. 6
- From multiple plug term. 5 to ground terminal.

Eliminate contact resistances in the plug-in connections.

* Code no. stamped on air-flow sensor (underneath connector)

Installation position of components:

Air-flow sensor: between air filter and intake manifold

Ground terminal: on left-hand side on intake manifold diagonally above the pressure regulator

Relay set: on right-hand side on firewall

Control unit: on driver's side left of steering column

C18

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US




C19

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step: 12

Operation		Reading	Testing
Program switch position "V":		on multimeter code no. 5 or 8: * <u>130...260Ω</u>	<u>Component:</u> Air-flow sensor
Program switch position "Ω":	7	Code no. 21: <u>260...520Ω</u>	<u>Operation:</u> Resistance between air-flow sensor-term. 8 and ground terminal
<u>Measuring equipment:</u> Multimeter (Ω range)			
<u>Measuring range:</u> x 10 Ω			
<u>Connection:</u> Test sockets blue			<u>Malfunction:</u> Resistance outside tolerance
<u>Operation in vehicle:</u>			

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0Ω):

Air-flow sensor

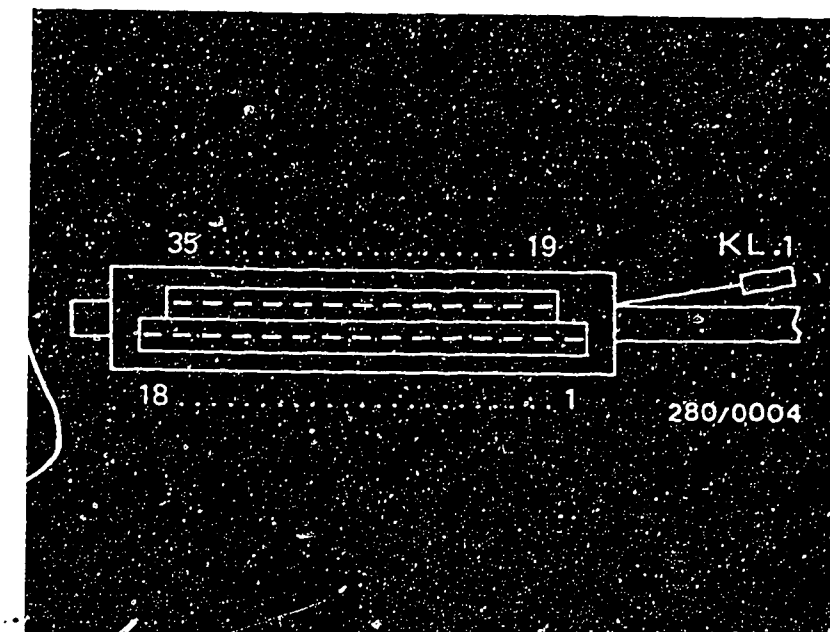
From multiple plug term. 8 to air-flow sensor term. 8

From air-flow sensor term. 6 to multiple plug term. 6

From multiple plug term. 5 to ground terminal.

Eliminate contact resistances in the plug-in connections.

* Code no. stamped on air-flow sensor (underneath the connector)



Top view of multiple plug
KL.1 = Terminal 1

Installation position of components:

Control unit: on driver's
side, left of steering column

Air-flow sensor:
between air filter and intake manifold

Ground terminal: on left-hand side on intake manifold diagonally above the pressure regulator



Test step: 13

Operation:

Program switch position

"V":



Program switch position

"Ω":

8

Measuring equipment: Multimeter
(Ω range)

Measuring range: x 10 Ω

Connection: Test sockets blue

Operation in vehicle: -

Reading

on multimeter

code no. 5 or 8: *
200...400Ω

code no. 21:

400...800Ω

Testing

Component:

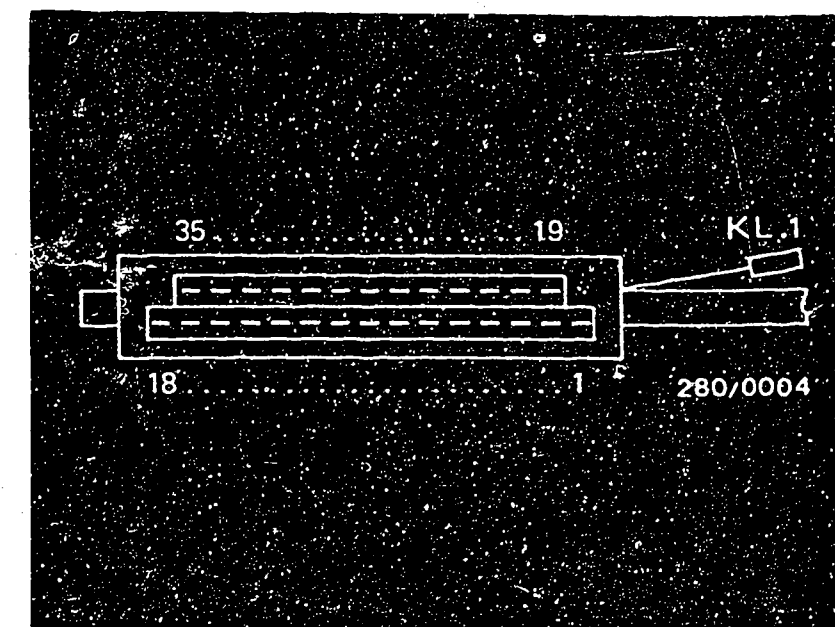
Air-flow sensor

Operation:

Resistance between air-flow
sensor term. 9 and ground
terminal

Malfunction:

Resistance outside tolerance



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0Ω):

Air-flow sensor:

From multiple plug term. 9 to air-flow sensor term. 9

From air-flow sensor term. 6 to multiple plug term. 6

From multiple plug term. 5 to ground terminal.

Eliminate contact resistances in the plug-in connections.

* Code no. stamped on air-flow sensor (underneath the connector)

Installation position of
components:

Control unit: on driver's
side, left of steering column

Air flow sensor:
between air filter and intake
manifold

Ground terminal: on left-hand
side on intake manifold
diagonally above the pressure
regulator

C22

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

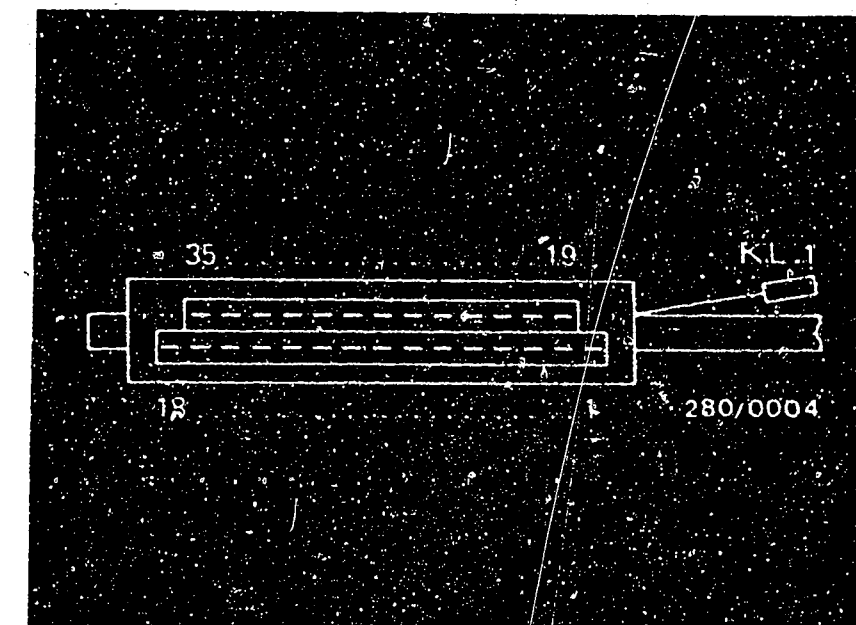


C23

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step: 14			
Operation		Reading	Testing
Program switch position "V":	↓	on multimeter 0...10Ω	Component: Throttle-valve switch (Idle contact)
Program switch position "Ω":	9	read off.	
Measuring equipment: Multimeter (Ω range)			Operation: Resistance between throttle- valve switch term. 2 and term. 18
Measuring range: x 1Ω			
Connection: Test sockets blue			Malfunction: Resistance outside tolerance
Operation in vehicle: Accelerator in rest position			



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Setting the throttle-valve switch (on right-hand side on intake manifold): (if possible) Slightly loosen the fastening screws of the throttle-valve switch. Connect ohmmeter to throttle-valve switch between term. 2 and term. 18. Turn the throttle-valve switch to the right until the idle contact (microswitch as of control unit ... 0 204) can be heard to click. (Reading 0Ω).

Checking the setting:

Pull on the throttle cable slightly. The idle contact (microswitch as of control unit ... 0 204) must be heard to click. (Reading ∞Ω).

Using ohmmeter, test the following leads for continuity (set value approx 0Ω):

- From multiple plug term. 2 to throttle-valve switch term. 2
- From throttle-valve switch term. 18 to multiple plug term. 18
- Eliminate contact resistances in the plug-in connections.

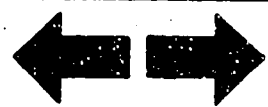
Installation position of components:

Throttle-valve switch:
on right-hand side on intake manifold

Control unit: on driver's side,
left of steering column

D1


Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

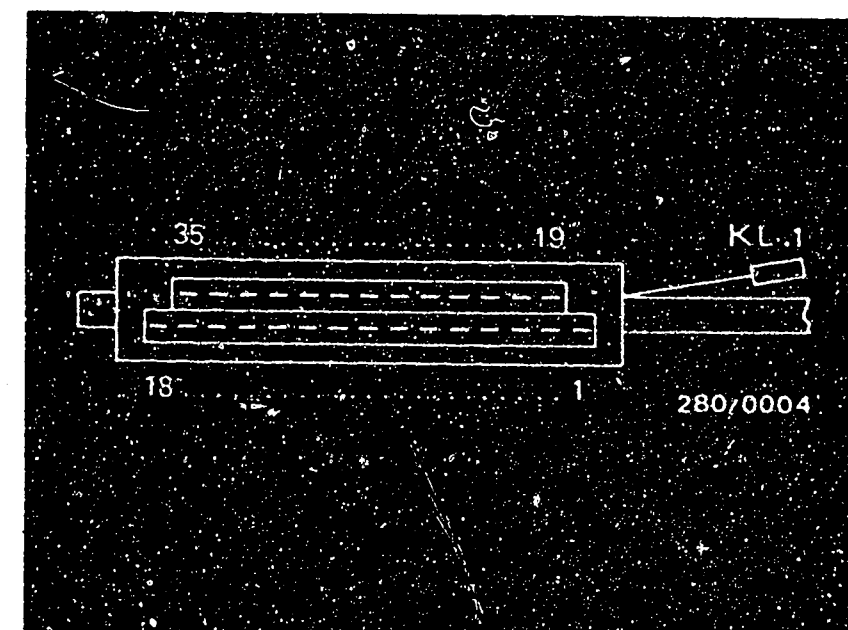


D2

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 15			
Operation		Reading	Testing
Program switch position "V":		on multimeter <u>0...10Ω</u> read off.	Component: Throttle-valve switch (Full-load contact)
Program switch position "Ω":	10		
Measuring equipment: Multimeter (Ω range)			Operation: Resistance between throttle- valve switch term. 3 and term. 18
Measuring range: x 1 Ω			
Connection: Test sockets blue			Malfunction: Resistance outside tolerance
Operation in vehicle: Accelerator in full-load pos- ition			



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0Ω):

From multiple plug term. 3 to throttle-valve switch term. 3
From throttle-valve switch term. 18 to multiple plug term. 18.

Eliminate contact resistances in the plug-in connections.

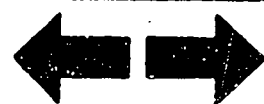
Installation position of components:

Throttle-valve switch:
on right-hand side on intake manifold

Control unit: on driver's side, left of steering column

D3


Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

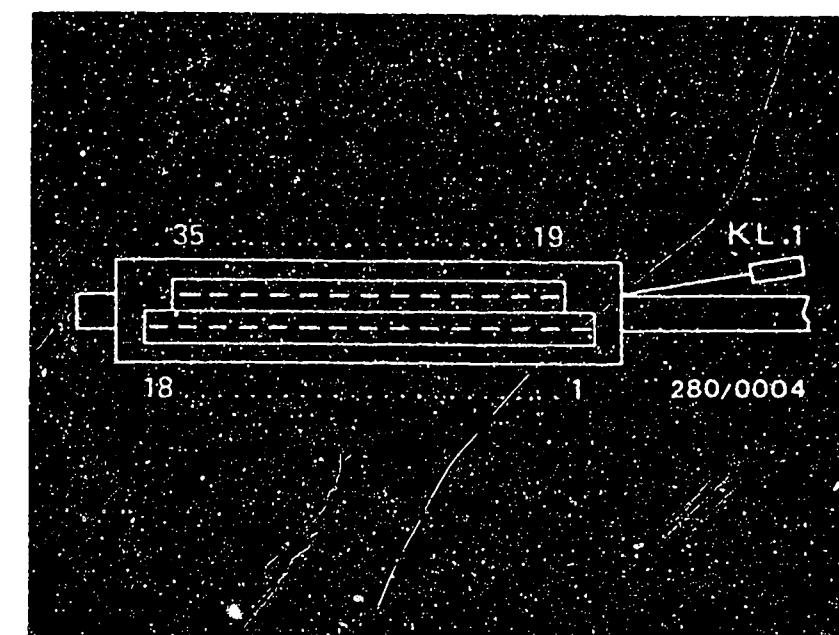


D4

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 16			
Operation		Reading	Testing
<u>Program switch position</u> "V":		on multimeter <u>30Ω... 30kΩ</u>	<u>Component:</u> Temperature sensor I (intake air)
<u>Program switch position</u> "Ω":	11	(depends on temp- erature) read off.	
<u>Measuring equipment:</u> Multimeter (Ω range)			<u>Operation:</u> Resistance on air-flow sensor between term. 27 and term. 6
<u>Measuring range:</u> x 10 Ω or x 100 Ω			
<u>Connection:</u> Test sockets blue			<u>Malfunction:</u> Resistance outside tolerance
<u>Operation in vehicle:</u>			



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Measure resistance directly at temperature sensor I (intake air) in air-flow sensor.

At ambient temperature (approx. 15-30° C): 1.45 ... 3.3 kΩ

Engine at normal operating temperature (approx 80° C): 280 ... 360 kΩ

Using ohmmeter, test the following leads for continuity (set value approx..0Ω):

From multiple plug term. 27 to air-flow sensor term. 27

From air-flow sensor term. 6 to multiple plug term. 6

From multiple plug term. 5 to ground terminal.

Eliminate contact resistances in the plug-in connections.

Installation position of components:

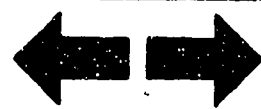
Control unit: driver's side,
left of steering column

Air-flow sensor:
between air filter and intake manifold

Ground terminal: on intake manifold on left-hand side diagonally above the pressure regulator

D5


Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

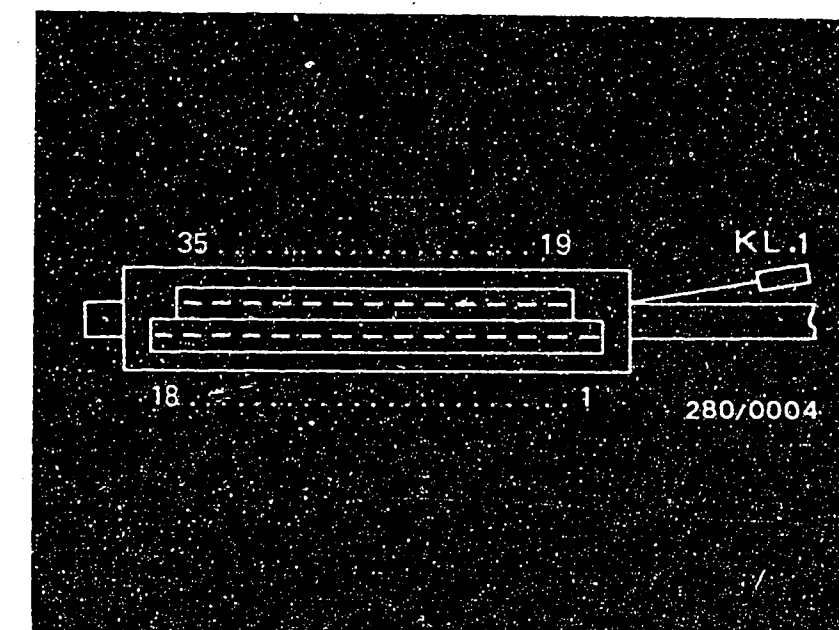


D6

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 17			
Operation		Reading	Testing
Program switch position "V":		on multimeter 30 Ω ... 30 kΩ	Component: Temperature sensor II (engine)
Program switch position "Ω":	12	(depends on temperature) read off.	
Measuring equipment: Multimeter (Ω range)			Operation: Resistance between control unit term. 10 and electronics ground terminal
Measuring range: x 10 Ω or x 100 Ω			Malfunction: Resistance outside tolerance
Connection: Test sockets blue			
Operation in vehicle: -			



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Measure resistance directly at temperature sensor II (engine) (blue plug):

At ambient temperature (approx. 15 - 30° C): 1.3 ... 3.6 k Ω

Engine at normal operating temperature (approx 80° C): 250 ... 390 Ω

Using ohmmeter, test the following leads for continuity (set value approx. 0 Ω):

From multiple plug term. 10 to temperature sensor II (engine) term. 10

Lead 38 from temperature sensor II to ground terminal.

Eliminate contact resistances in the plug-in connections.

Installation position of components:

Engine temperature sensor:
in cooling water circuit,
near fan

Ground terminal: on intake
manifold on left-hand side,
diagonally above the pressure
regulator

Control unit: on driver's
side, left of steering column

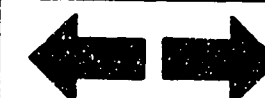
D7

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

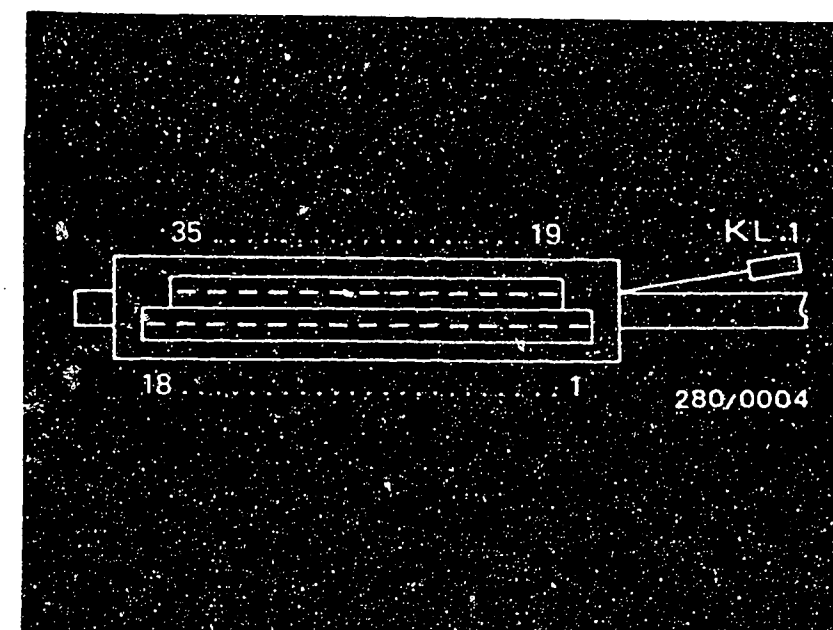


D8

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 18			
Operation		Reading	Testing
Program switch position "V":	↓	on multimeter	Component: Ground connection of output stage
Program switch position "Ω":		0 ... 10Ω	
		read off.	
Measuring equipment: Multimeter (Ω range)			Operation: Ground connection of control unit
Measuring range: x 1Ω			
Connection: Test sockets blue			Malfunction: Resistance outside tolerance
Operation in vehicle: -			



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0Ω):

From multiple plug term. 16 to ground terminal.

From multiple plug term. 5 to ground terminal.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

Ground terminal: on intake manifold on left-hand side, diagonally above the pressure regulator

Control unit: on driver's side, left of steering column

D9


Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US

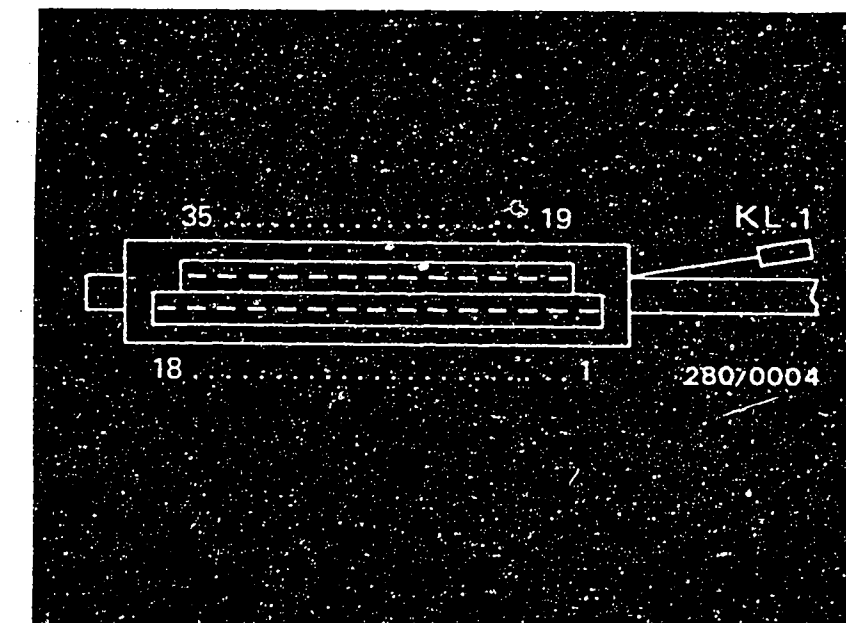


D10

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Test step 19			
Operation		Reading	Testing
Program switch position "V":		on multimeter 0 ... 10Ω	<u>Component:</u> Ground connection of output stage
Program switch position "Ω":	14	read off.	
Measuring equipment: Multimeter (Ω range)			<u>Operation:</u> Ground connection of control unit
Measuring range: x 1 Ω			
<u>Connection:</u> Test sockets blue			
<u>Operation in vehicle:</u> -			
			<u>Malfunction:</u> Resistance outside tolerance



Top view of multiple plug
KL.1 = Terminal 1

Trouble-shooting:

For testing, remove the wiring-harness plug from the test adaptor and use the circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0Ω):

From multiple plug term. 17 to ground terminal.

From multiple plug term. 5 to ground terminal.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

Ground terminal: on intake manifold on left-hand side, diagonally above the pressure regulator

Control unit: on driver's side, left of steering column

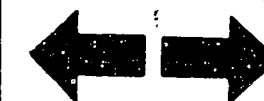
D11

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



D12

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Testing with the universal test adaptor is now completed.
If the fault has not been found or if you require further
information and instructions on how to remedy the fault,
continue with the trouble-shooting program of your choice

Detailed trouble-shooting see B 3

Direct trouble-shooting see B 5

D 13

Test chart for universal test adaptor
Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

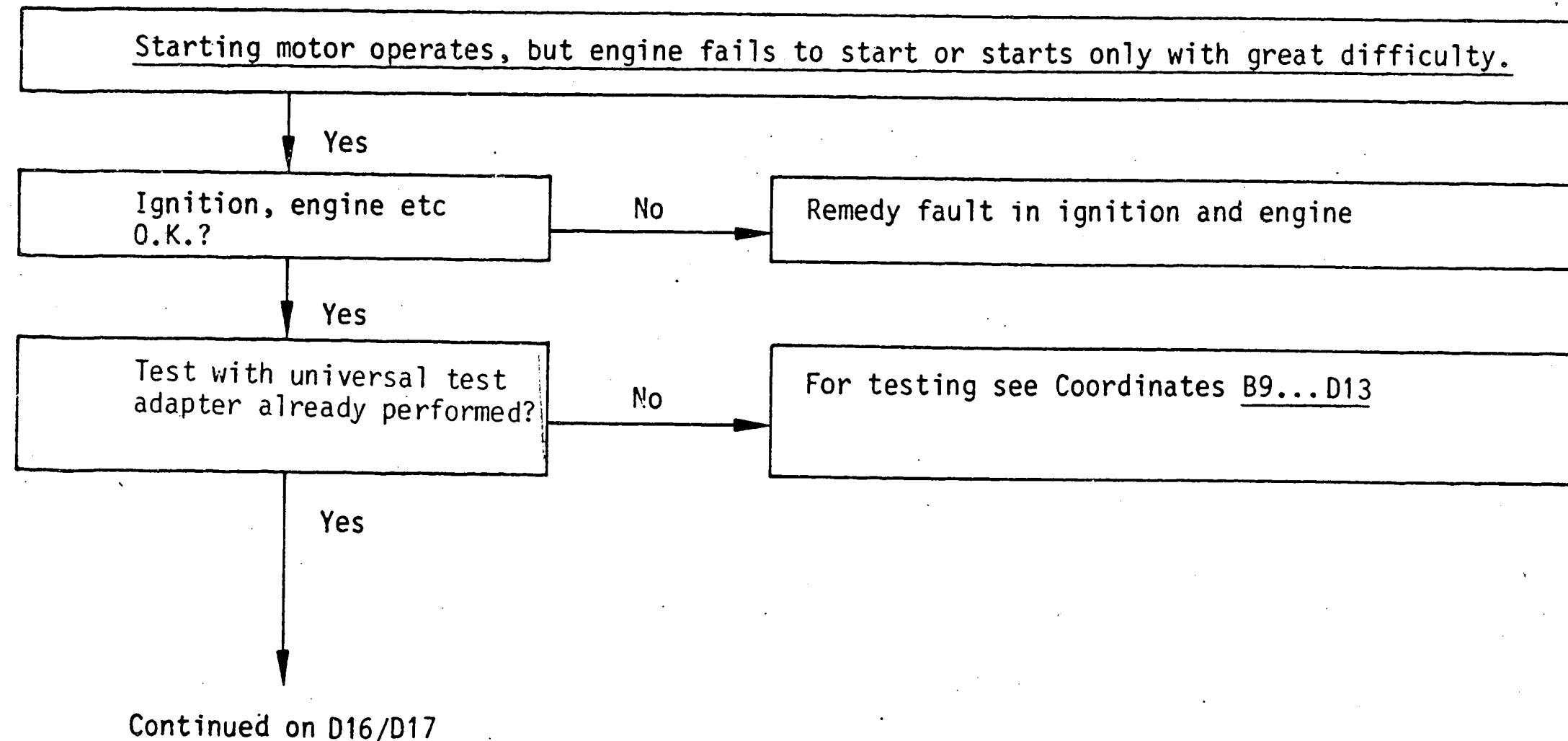
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.

**D14**

Engine fails to start

Fiat 132/Argenta/Spider 2000 US

**D15**

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

Fuel pump operating? (listen)
Relay set O.K.?

No

1. Test relay set.
For testing, screw off relay set and turn round so that connection bases are accessible from below.

Test voltage supply.

Switch on ignition. Using voltmeter, measure battery voltage at term. 88z, 88b, 88e and 88a to vehicle ground. If no voltage, test connecting leads. Lead O.K.? If yes →

2. Test resistance at relay set between term. 86b (connection of positive pole) and term 85.
With relay set 0 332 514 105:

50...110 Ω

With relay set 0 332 514 121/127:

70...500 Ω

O.K.? If yes →

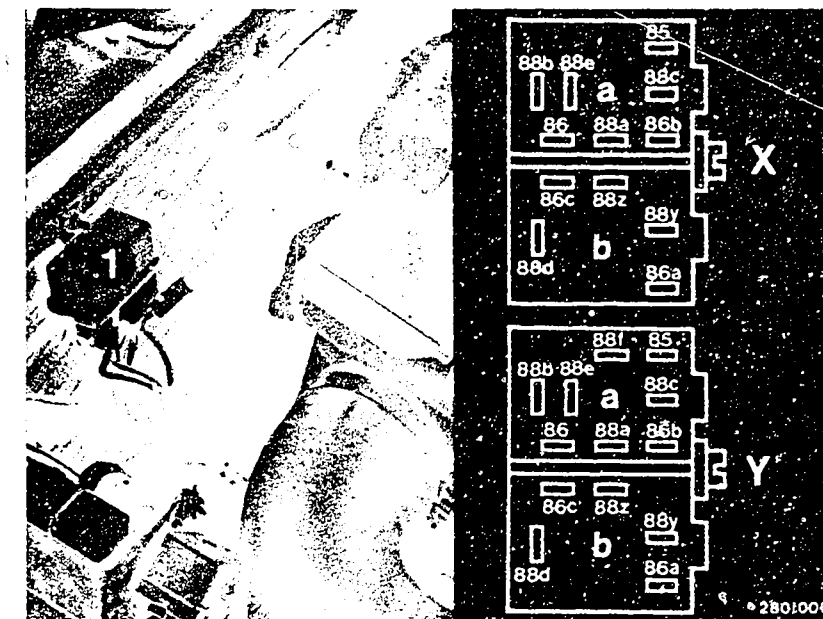
3. Start engine. Test voltage at disconnected pump plug (set value min. 12 V). If no voltage: Test voltage at pump fuse and relay set term. 88y and 88c.

Voltage at term. 88y → replace pump fuse.

No voltage at term. 88d → replace relay set.

Yes

Continued on D18/D19



Connection base (viewed from below)

1 = Relay set

x = 0 332 514 105

y = 0 332 514 121/127

1 = Electric fuel pump

2 = Fuel filter

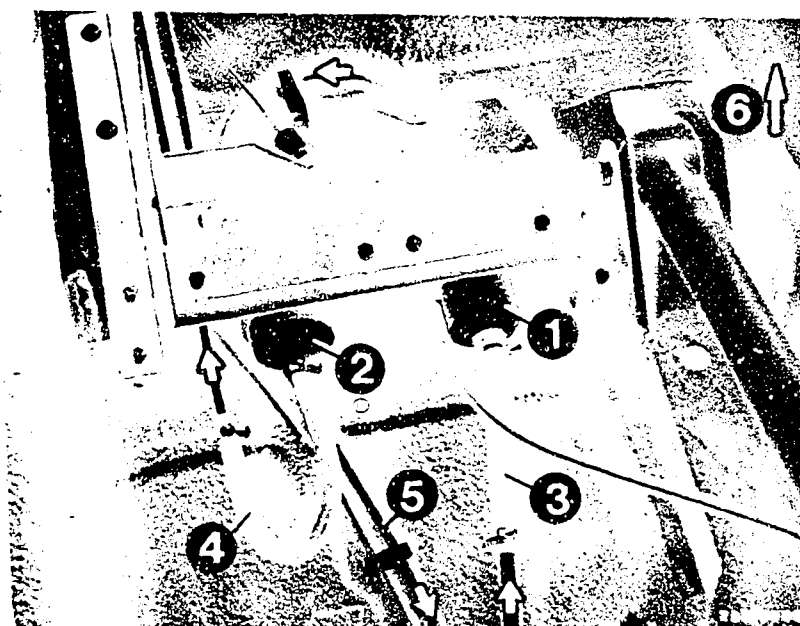
3 = Fuel intake line

4 = Fuel delivery line

5 = Fuel return line

6 = Direction of travel

Arrow = Direction of fuel flow



D16

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



D17

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Fuel pump operating? (Listen)
Relay set O.K.?
(Continued)

No

4. Ground connection of fuel pump O.K.?
If not → check ground terminal (on left-hand rear roof post on left-hand side) and ground lead for open circuit and proper connection. Fuel pump operating? If not →
5. Start engine. Test voltage at disconnected pump plug (set value min. 12 V). If voltage, replace fuel pump.

Yes

Fuel pressure O.K.?

Test specification
1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

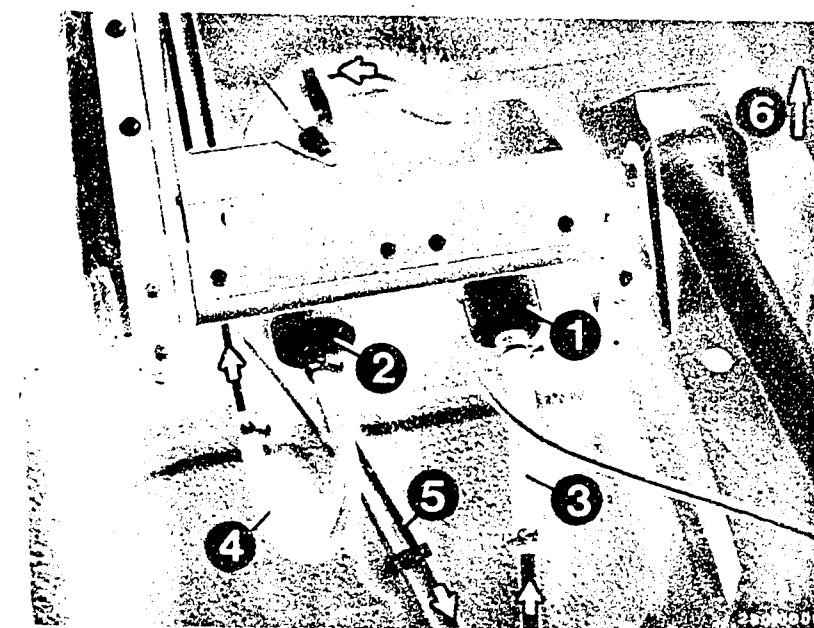
No

Testing: Remove hose from start valve. Connect pressure gauge.
Caution: When removing the fuel hose make sure that no fuel gets onto hot parts of the engine.

Yes

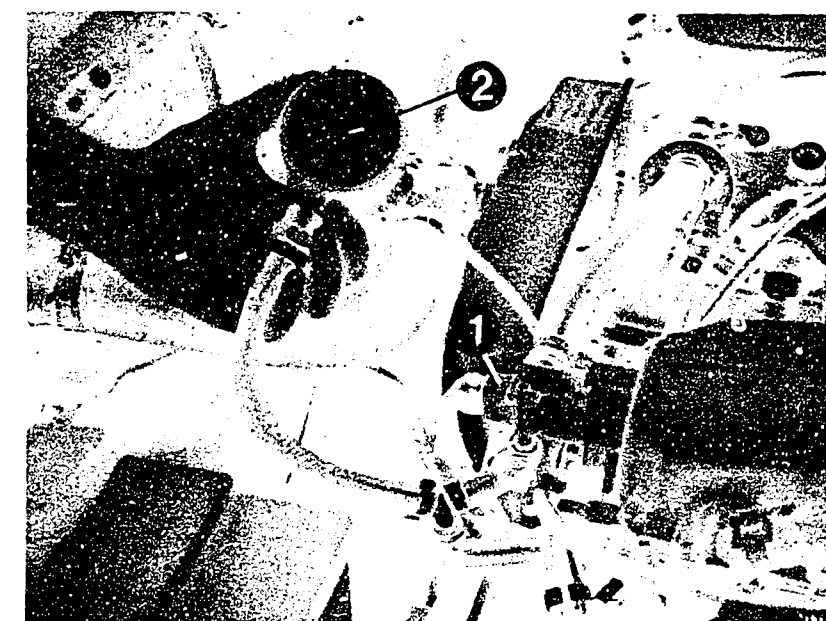
Yes

Continued on D20/D21



1 = Electric fuel pump
2 = Fuel filter
3 = Fuel intake line
4 = Fuel delivery line
5 = Fuel return line
6 = Direction of travel
Arrow = Direction of fuel flow

1 = Start valve
2 = Pressure gauge



D18

Engine fails to start
Fiat 132/Argenta/Spider 2000 US



D19

Engine fails to start
Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Fuel pressure O.K.?

Test specification
1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

No

Testing the fuel pressure

Connect the connections of the pressure testers into the fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw.

Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the fuel distribution pipe.

Make sure there are no leaks.

Switch on ignition. Remove hose between air filter and air-flow sensor. Deflect air-flow sensor flap slightly (pump contact must close). Fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta
2.8...3.2 bar

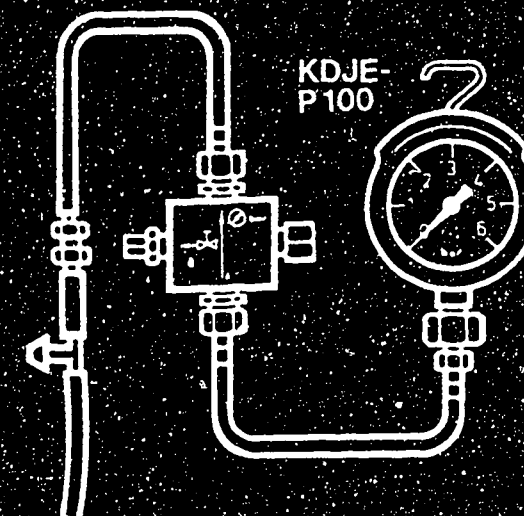
Fiat Spider 2000 US
2.3...2.7 bar

Let engine idle → fuel pump pressure approx. 2.5 bar (132/Argenta) and 2.0 bar (Spider 2000 US).

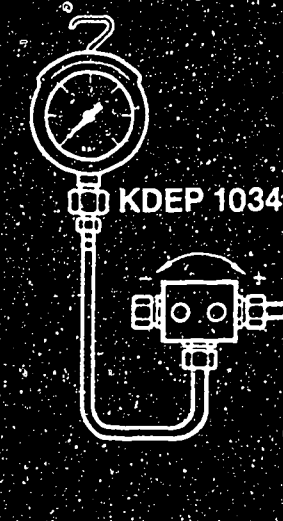
Yes

Yes

Continued on D22/D23



280/0331



280/0332



1687 231 154

280/0333

D20

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



D21

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Pressure regulator O.K.?
Test specification reached?

No

Yes

Continued on E 1/E 2

Testing the pressure regulator

Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close).
Electric fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta

2.8...3.2 bar

Fiat Spider 2000 US

2.3...2.7 bar

Fuel pressure of 2.8 bar (132/Argenta) or
2.3 bar (Spider 2000 US) not reached:

1. Slowly pinch off fuel return line:
(Caution: Do not load pressure gauge
above 6 bar).

Pressure rises above 4 bar → replace
pressure regulator.

Pressure remains below 4 bar → replace
fuel pump.

2. Check fuel delivery line and fuel filter
for throughflow.

3. Strainer in tank clogged.

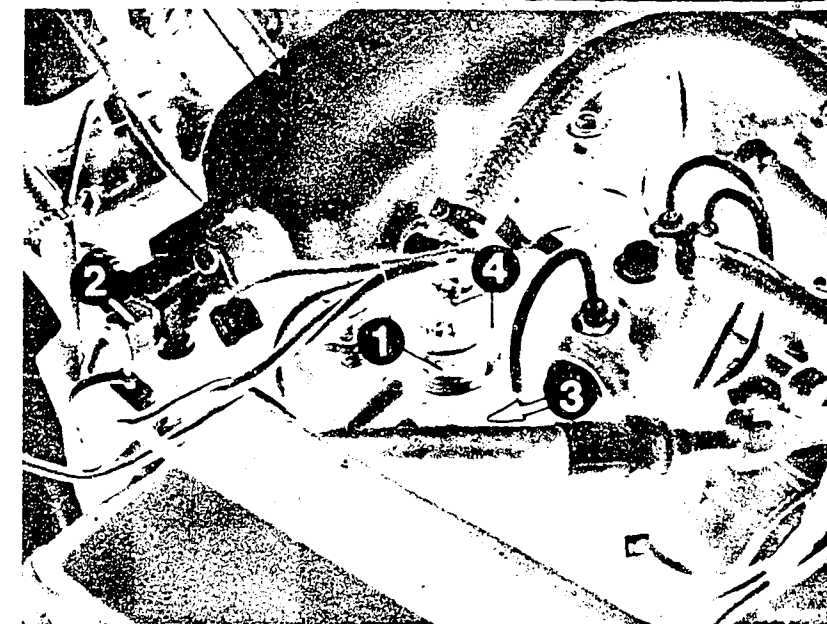
4. Corrosion in tank.

Fuel pressure of 3.2 bar (132/Argenta) or
2.7 bar (Spider 2000 US) exceeded:

1. Fuel return line clogged or pinched.

2. Replace pressure regulator.

Fit hose between air filter and air-flow
sensor and tighten hose clamp (leaks).



1 = Pressure regulator

3 = Fuel return line

1 = Electric fuel pump

2 = Fuel filter

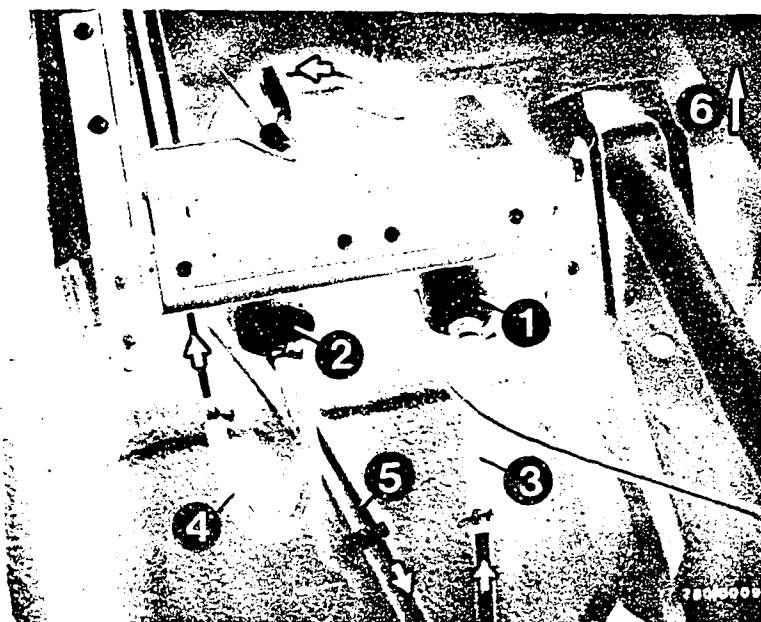
3 = Fuel inlet line

4 = Fuel delivery line

5 = Fuel return line

6 = Forwards travel

Arrow: Direction of fuel return



D22

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



D23

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Start valve O.K.?

No

Functional test: Test power supply to start valve when starting. To do this, remove plug from start valve and connect voltmeter to term. 46 and term 45/term. 47 of start valve plug.

Coolant at ambient temperature (approx. $+15^{\circ}\dots 30^{\circ}\text{C}$):

Voltage reading min. 6 V

Coolant with engine at normal operating temperature (approx. $+80^{\circ}\text{C}$):

Voltage reading approx. 0 V

Test the following leads for continuity with ohmmeter (set value approx. $0\ \Omega$):

Lead from start valve term. 46 to thermo-time switch term. W.

Lead from start valve term. 45 to thermo-time switch term. G.

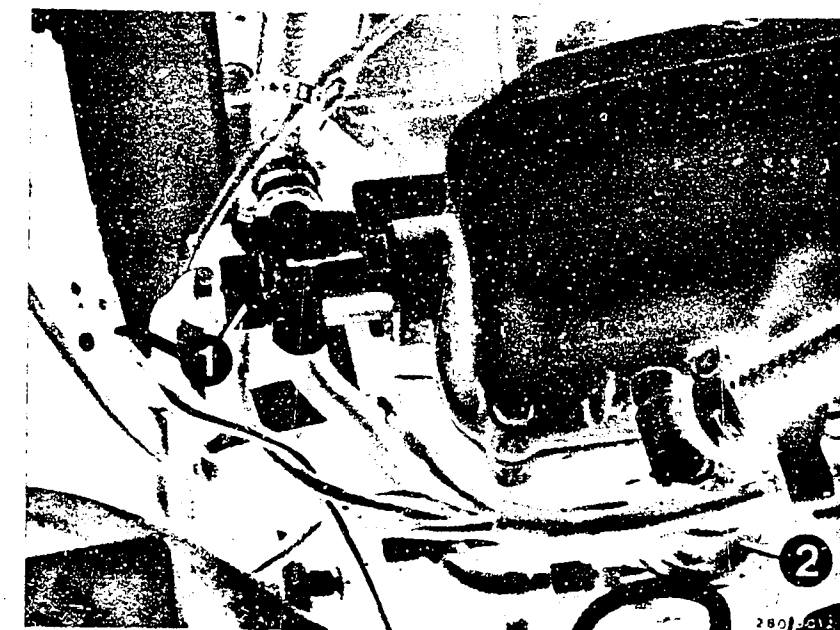
Lead from start valve term. 47 to relay set term. 86.

Check ground connection of thermo-time switch.

Yes

Yes

Continued on E 3/E 4



1 = Start valve

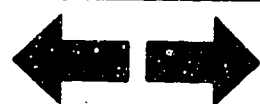
Arrow = Thermo-time switch



E1

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



E2

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Start valve O.K.?
(Continued)

No

Electric test of start valve:

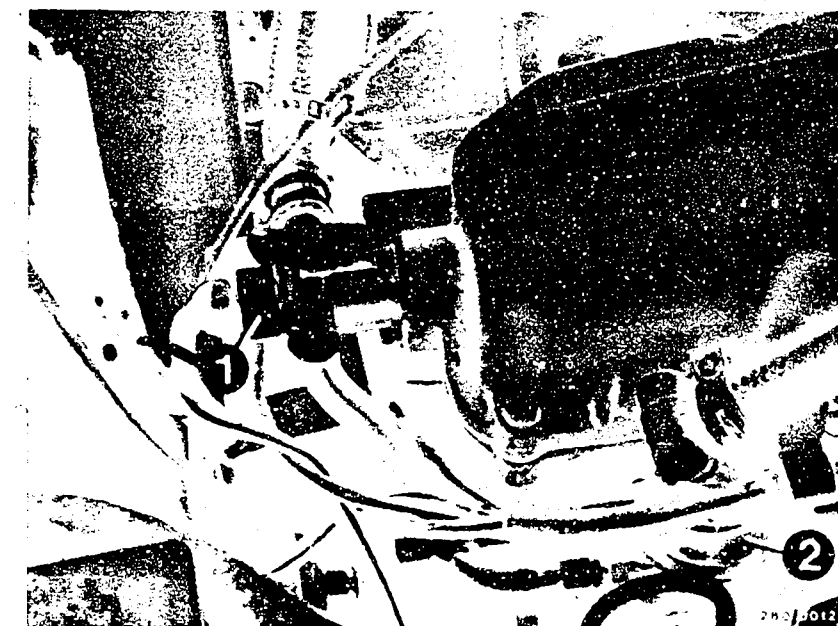
Connect ohmmeter to start valve (remove plug):
Set value approx. 4Ω .

Mechanical test of start valve:

Remove start valve from intake manifold and hold in a container. (Caution! Fire hazard!). When starting at temperatures below ambient temperature (approx. $+15^{\circ}\text{...}30^{\circ}\text{C}$) the start valve must squirt (max. 8 sec.). With the engine at normal operating temperature (approx. $+80^{\circ}\text{C}$) the start valve must not squirt. With the ignition switched on and the pressure built up the start valve must likewise not squirt.

Yes

Continued on E 5/E 6



1 = Start valve

Arrow = Thermo-time switch



E3

Engine fails to start

Fiat 132/Argent/Spider 2000 US



E4

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Start valve O.K.?
(Continued)

No

Carry out squirt test for engine at normal operating temperature (approx. +80°C) as follows: Remove plug from thermo-time switch and ground term. W.

Testing the start valve for leaks:

1. When installed

Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.

2. When removed

Remove start valve (Caution! Fire hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (remove hose between air filter and air-flow sensor. Ignition "ON" and deflect air-flow sensor flap).

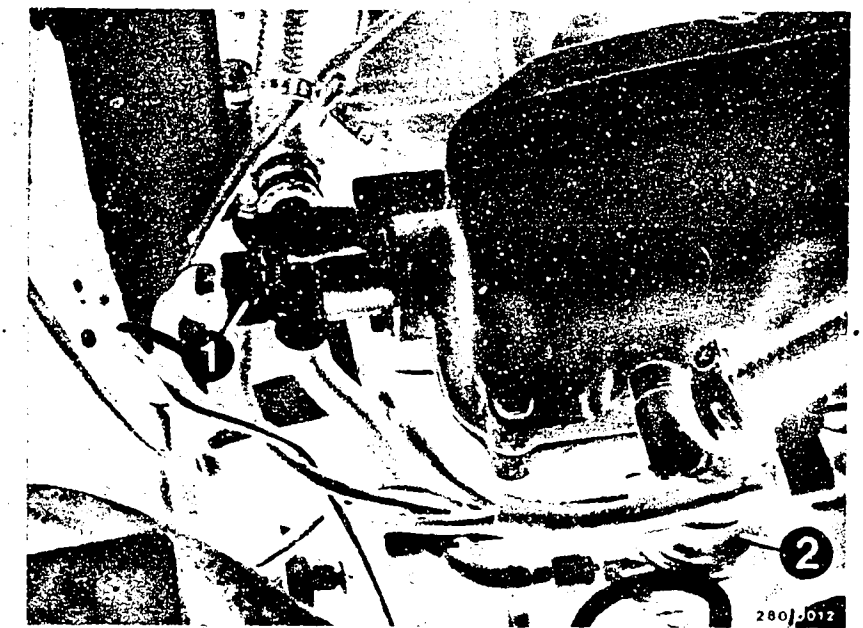
Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Caution!

After the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight.

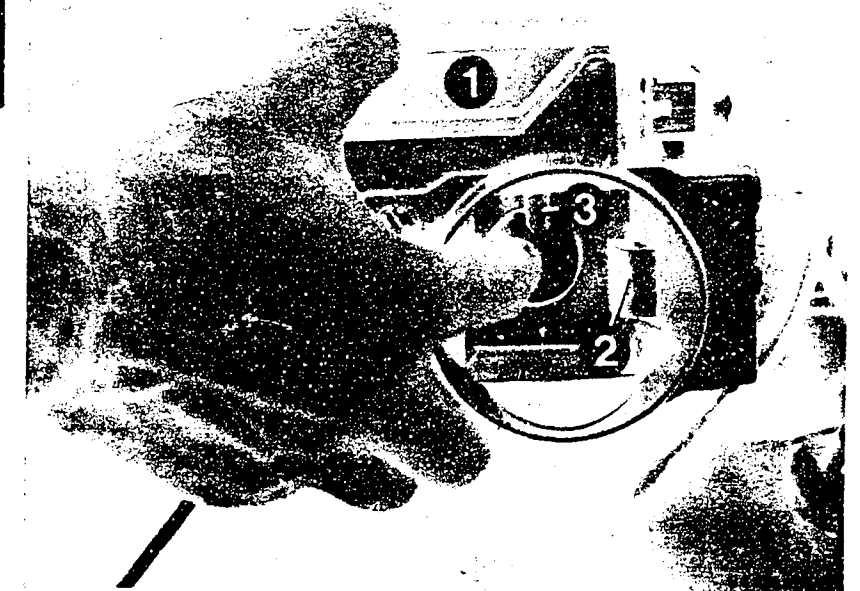
Yes

Continued on E 7/E 8



1 = Start valve
2 = Pressure regulator

Opening the air-flow sensor flap



E5

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



E6

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Thermo-time switch
O.K.?

No

Electrical test

Test thermo-time switch 35°/8 sec. as follows:
Remove plug and make direct resistance measurement
at thermo-time switch using ohmmeter.

	Between term. "G" + ground	Between term. "W" + ground	Between term. "G" + "W"
Ambient temperature (below 30°C)	25...40 Ω	0 Ω	25...40 Ω
Engine at normal operating temperature (above 40°C)	50...80 Ω	100...160 Ω	50...80 Ω

Yes

Auxiliary-air device tested?
(Mechanically O.K.?)

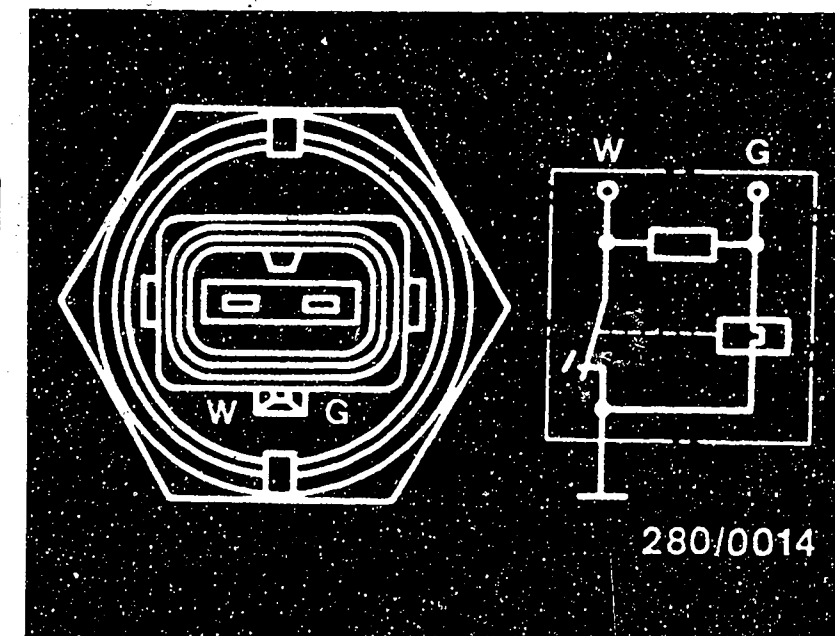
No

Testing:

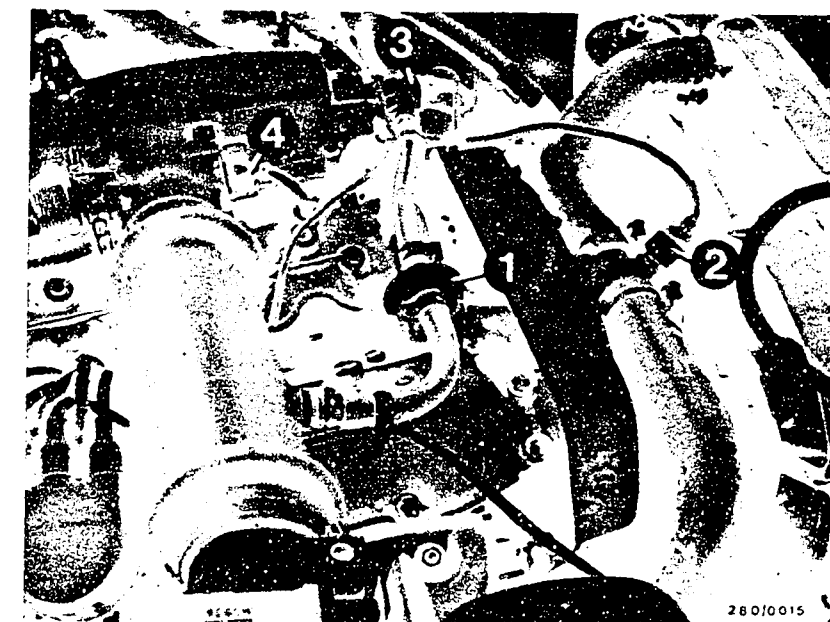
1. Visual examination of auxiliary-air device:
When cold, the device must be open; when the
engine is warm, it must be closed. If not, re-
place auxiliary-air device. (Remove hoses and
look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to
auxiliary-air device. Engine speed must drop.
With the engine warm, pinch off hose to aux-
iliary-air device. Engine speed must not drop.
If incorrect, replace auxiliary-air device
(pay attention to direction of flow).

Yes

Continued on E 9/E10



1 = Auxiliary-air device
2 = Temperature sensor II
(engine)



E7

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



E8

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Temperature sensors tested?

No

Testing:

Temperature sensor I measures the intake air temperature and is located in the air duct of the air-flow sensor. Measure the following values between term. 27 and term. 6 of air-flow sensor:

At ambient temperature
(approx. 15...30°C): 1.45...3.3 kΩ

With engine at normal operating temperature
(approx. 80°C): 280...360 Ω

Make direct resistance measurement at temperature sensor II (engine) using ohmmeter. Resistance measurement at term. 13 and term. 49 (ground):

At ambient temperature
(approx. 15...30°C): 1.3...3.6 kΩ

With engine at normal operating temperature
(approx. 80°C): 250...390 Ω

If incorrect, check for open circuit or short circuit in following leads using ohmmeter:

Temperature sensor I:

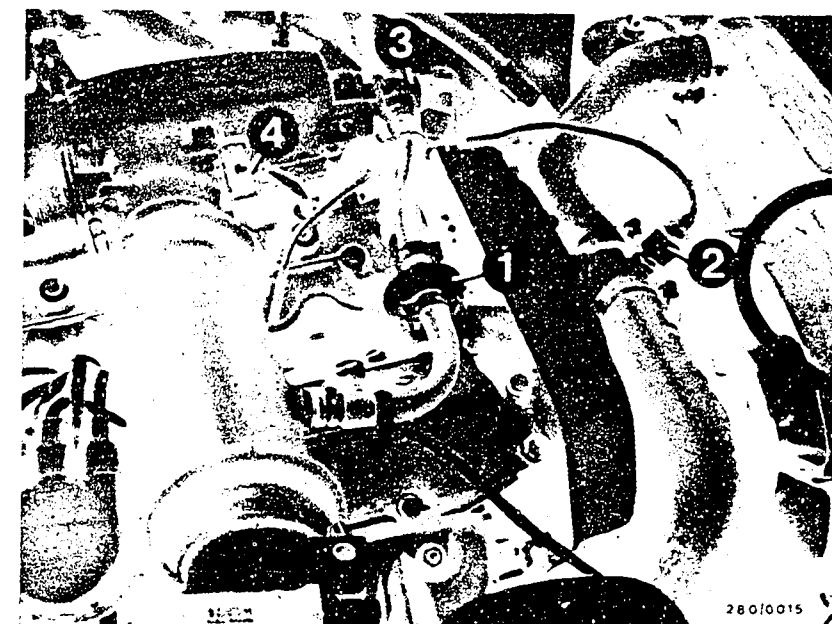
Multiple plug term. 27 to air-flow sensor term. 27 and air-flow sensor term. 6 to multiple plug term. 6.

Temperature sensor II:

Multiple plug term. 13 to temperature sensor II term. 13 and temperature sensor II term. 49 to central ground (lead 49).

Check all contacts in the plug-in connections.

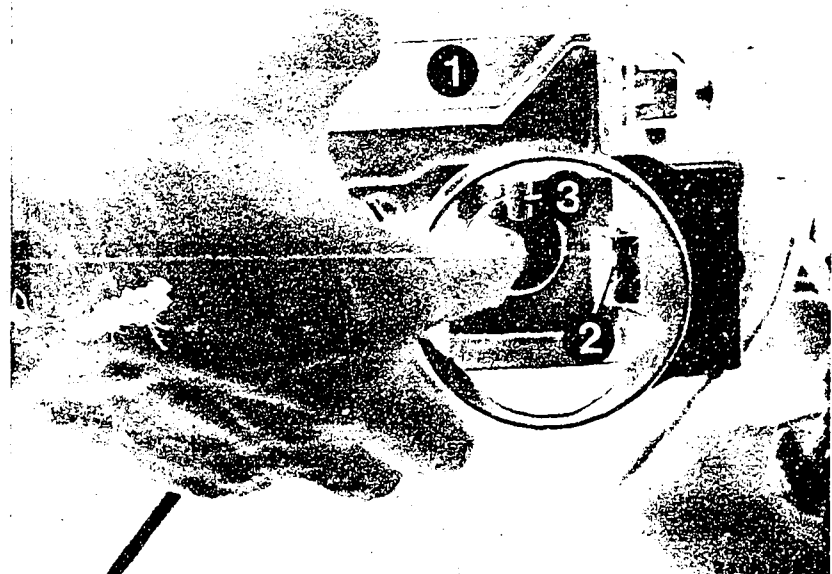
Continued on E11/E12



1 = Auxiliary-air device

2 = Temperature sensor II
Engine

Pushing open the air-flow sensor flap



E9

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



E10

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Air-flow sensor O.K.?

No

Testing:

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohm-meter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect sensor flap (remove hose between air filter and air-flow sensor).

Test specifications:

0 280 202 017

(with code number
5 or 8):

100...500 Ω

0 280 202 017 and

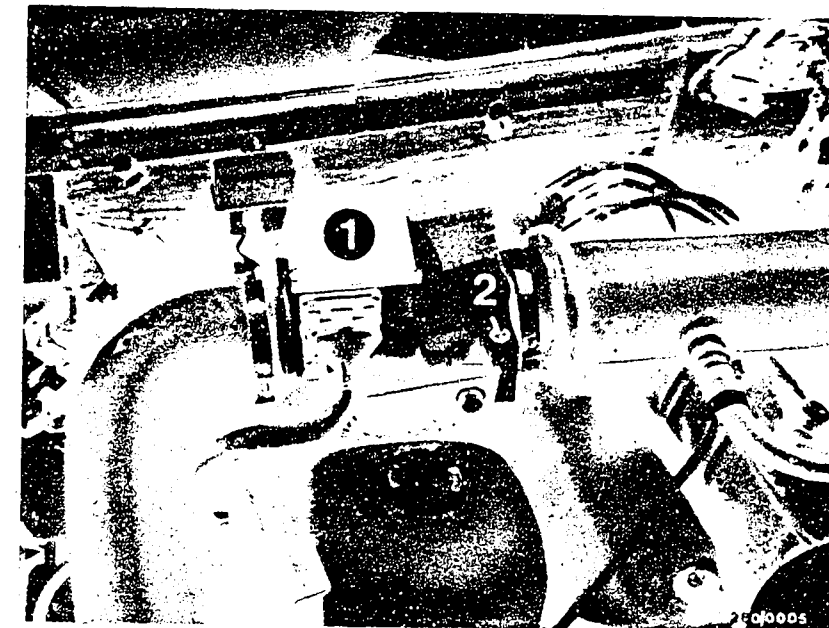
0 280 202 019...23

(with code number 21):

200...1000 Ω

Caution!

When the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight (leaks).

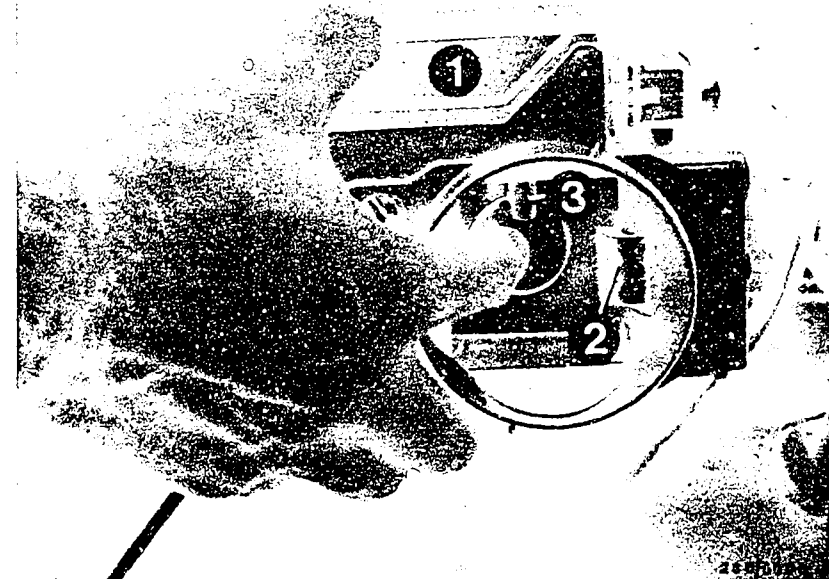


1 = Air-flow sensor

2 = Bypass screw
(CO adjustment)

Turning in clockwise direction =
richer mixture

Pushing open the air-flow sensor
flap



Continued on E13/E14

E11

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



E12

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Starting motor operates, engine fails to start or starts only with great difficulty
(Continued)

Are all hose lines and electric leads securely attached?
Visual examination. Is the air-intake system leak-tight?

Yes

Testing completed for
customer complaint

"Starting motor operates,
engine fails to start"

Customer complaint
remedied?

No

Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

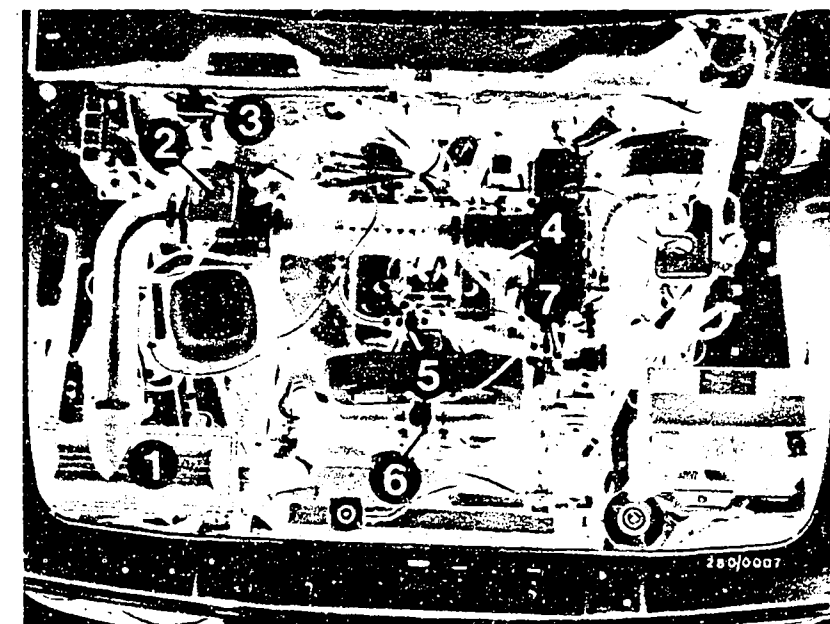
Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose connection.

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (Compression, valve setting, valve timing, worm camshaft).



Overall view of engine

- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Relay set
- 4 = Throttle-valve switch
- 5 = Auxiliary-air device (black plug)
- 6 = Temperature sensor II (white plug)
- 7 = Start valve (blue plug)

E13

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



E14

Engine fails to start

Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

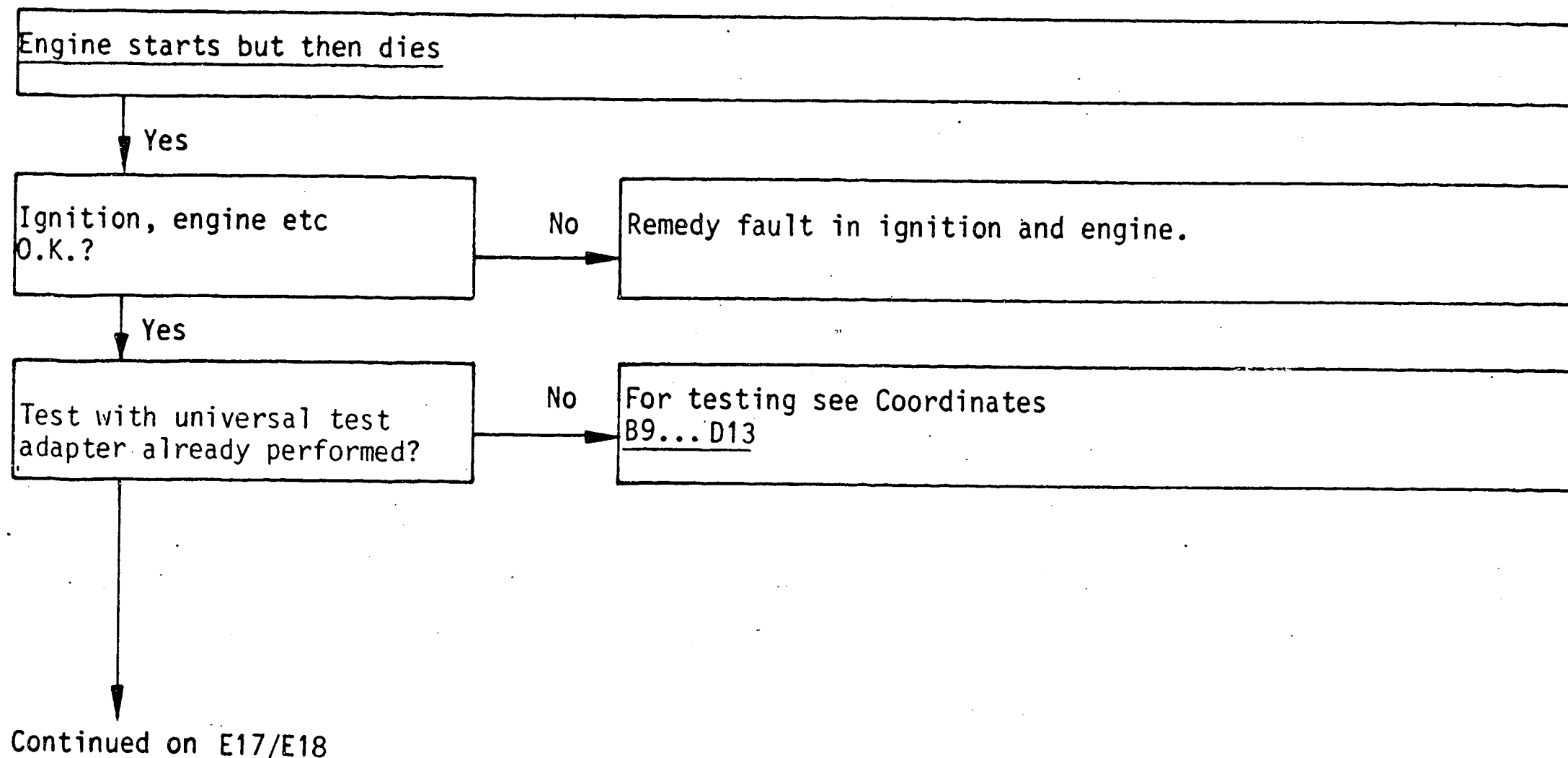
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.

**E15**

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US

**E16**

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Does fuel pressure remain constant after the engine has started?

Yes

Fuel pressure O.K.?

Test specification
1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

Yes

Continued on E19/E20

No

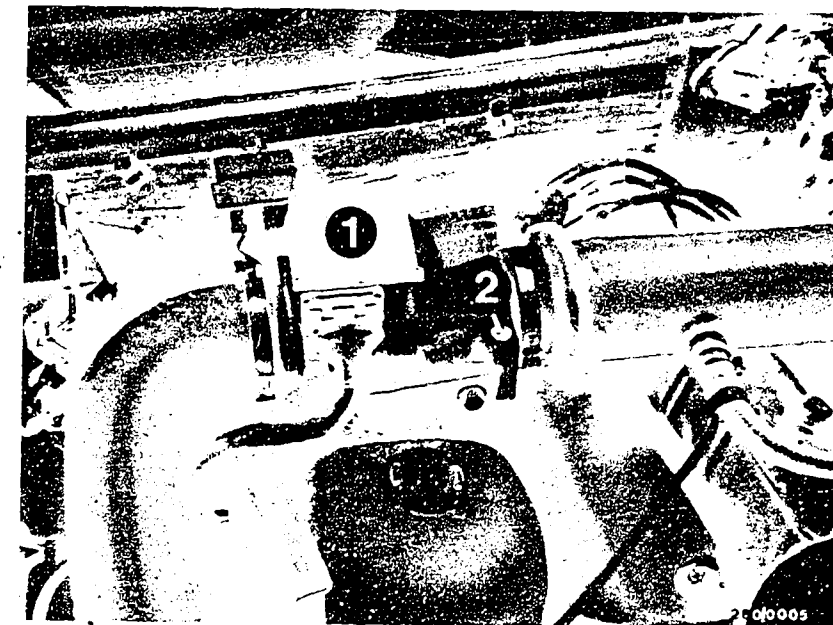
Test fuel pump contact in air-flow sensor:

Remove air hoses and connector. Connect ohmmeter to term. 36 and term. 39 of air-flow sensor. Open air-flow sensor flap slightly by hand. Reading must change from $\infty \Omega$ to 0Ω . If not, replace air-flow sensor.

No

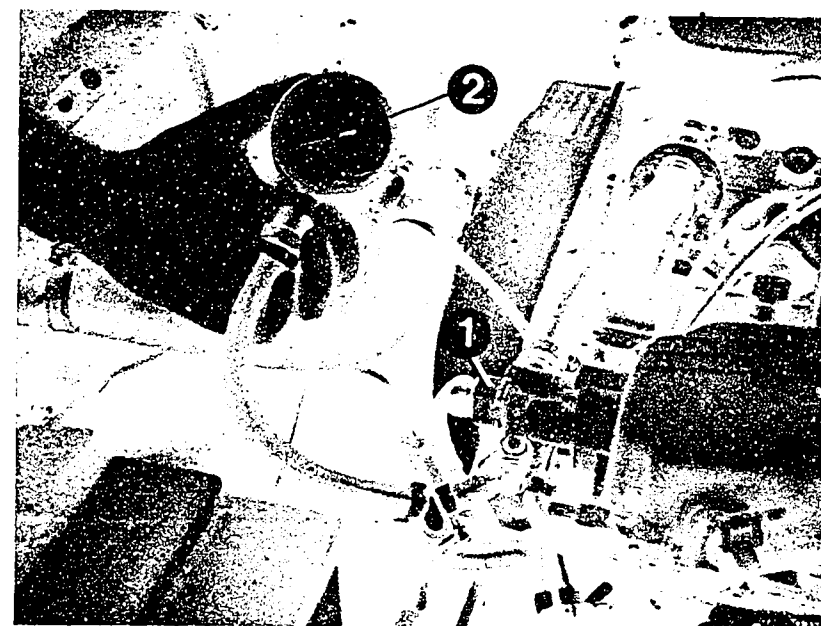
Testing: Remove hose from start valve. Connect pressure gauge.
Caution: When removing the fuel hose make sure that no fuel gets onto hot parts of the engine.

Yes



1 = Air-flow sensor
2 = Bypass screw
(CO adjustment)
Turning in clockwise
direction = richer mixture

1 = Start valve
2 = Pressure gauge



E17

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



E18

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

No

Testing the fuel pressure

Connect the connections of the pressure testers into the fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw.

Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the pressure regulator.

Make sure there are no leaks.

Remove hose between air filter and air-flow sensor. Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close). Fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta
2.8...3.2 bar

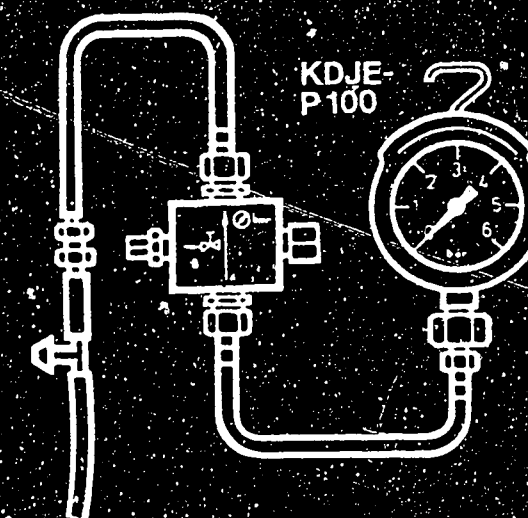
Fiat Spider 2000 US
2.3...2.7 bar

Let engine idle → fuel pump pressure approx. 2.5 bar (132/Argenta) and 2.0 bar (Spider 2000 US).

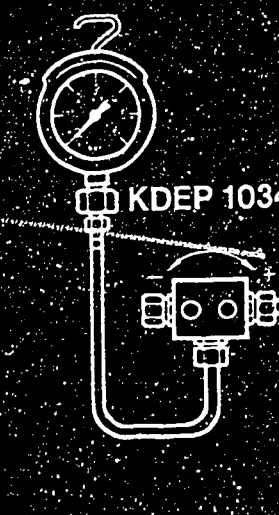
Yes

Yes

Continued on E21/E22



280/0331



280/0332



1687 231 154

280/0333

E19

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



E20

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Pressure regulator O.K.?

Test specification reached?

no

yes

Testing the pressure regulator

Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close). Electric fuel pump must operate.

Fuel pump pressure

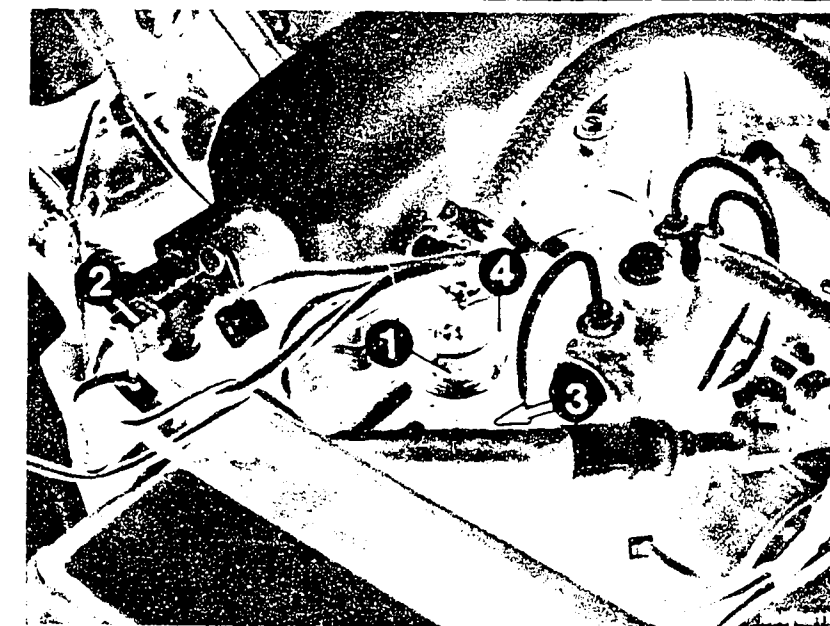
1. Fiat 132/Argenta
2.8...3.2 bar
2. Fiat Spider 2000 US
2.3...2.7 bar

Fuel pressure of 2.8 bar (132/Argenta) or 2.3 bar (Spider 2000 US) not reached:

1. Slowly pinch off fuel return line: (caution: do not load pressure gauge above 6 bar).
Pressure rises above 4 bar → replace pressure regulator.
Pressure remains below 4 bar → replace fuel pump.
2. Check fuel delivery line and fuel filter for throughflow.
3. Strainer in tank clogged.
4. Corrosion in tank.

Fuel pressure of 3.2 bar (132/Argenta) or 2.7 bar (Spider 2000 US) exceeded:

1. Fuel return line clogged or pinched.
 2. Replace pressure regulator.
- Fit hose between air filter and air-flow sensor and tighten hose clamp.



- 1 = Pressure regulator
3 = Fuel return line

- 1 = Electric fuel pump
2 = Fuel filter
3 = Fuel intake line
4 = Fuel delivery line
5 = Fuel return line
6 = Direction of travel
Arrow = Direction of fuel flow

Continued on E23/E24

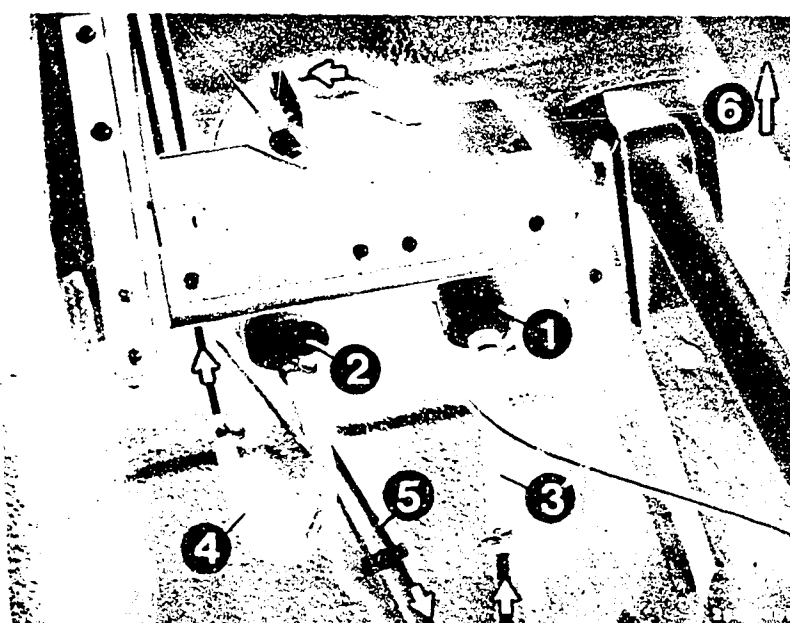
E21

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



E22

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Start valve O.K.?
(Leak test)

no

Testing the start valve for leaks:

1. When installed:

Pinch off the fuel delivery line to the start valve.
If engine then runs smoothly, replace start valve.

2. When removed

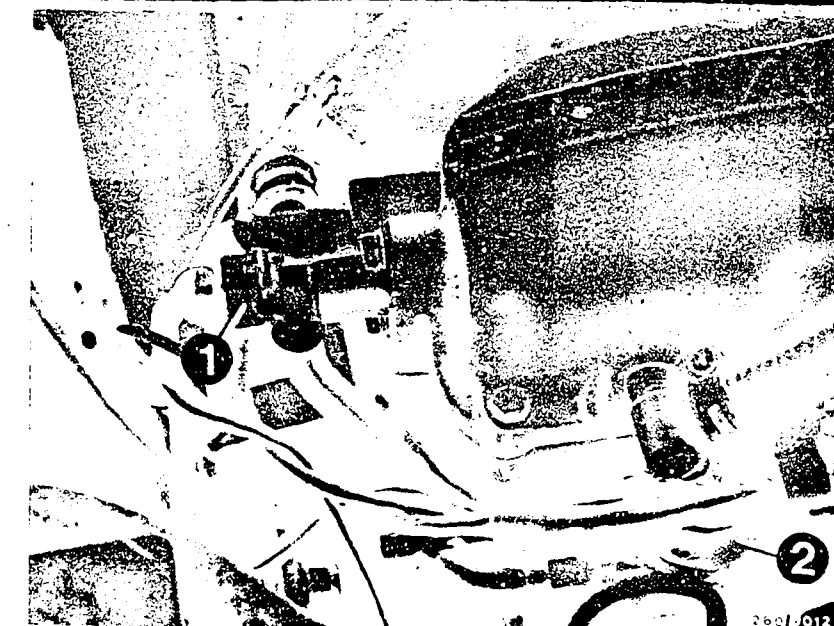
Remove start valve (caution! fire hazard!). Fuel line and electric lead remain connected. (Place collector vessel under the start valve). Build up fuel pressure (remove hose between air filter and air-flow sensor. Ignition "ON" and deflect air-flow sensor flap).

Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Caution!

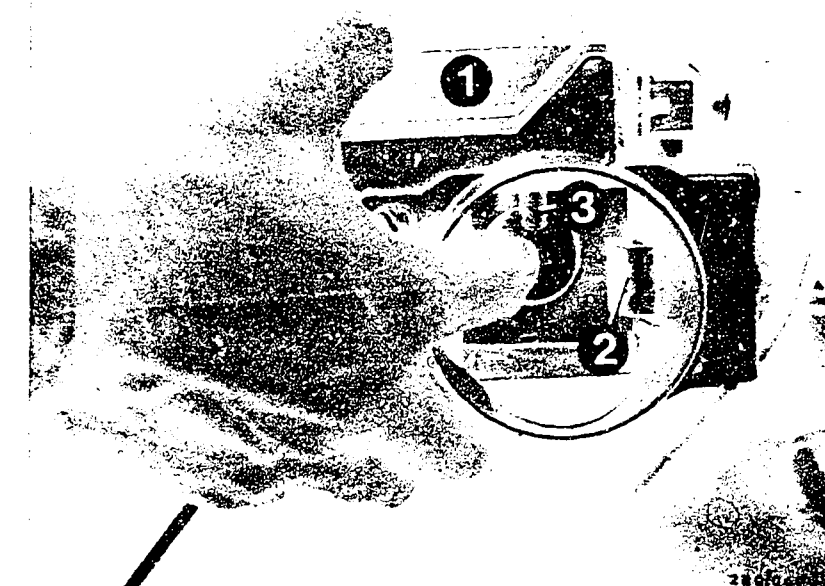
After the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight (leaks).

yes



1 = Start valve
2 = Pressure regulator

Pushing open the air-flow sensor flap



Continued on F1/F2

E23

Engine starts but then dies

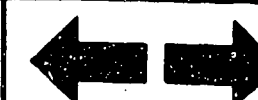
Fiat 132/Argenta/Spider 2000 US



E24

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Auxiliary-air device
tested? (mechanically
O.K.?)

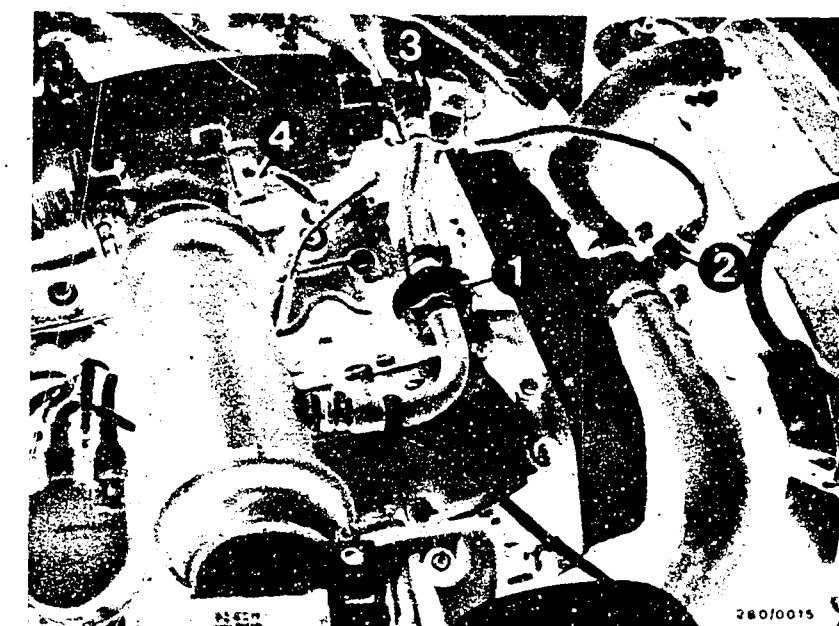
No

Testing:

1. Visual examination of auxiliary-air device:
When cold, the device must be open; when the
engine is warm, it must be closed. If not,
replace auxiliary-air device. (Remove hoses
and look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to
auxiliary-air device. Engine speed must drop.
With the engine warm, pinch off hose to
auxiliary-air device. Engine speed must not
drop. If incorrect, replace auxiliary air
device (pay attention to direction of flow).

Yes

Continued on F 3/F 4



1 = Auxiliary-air device
2 = Temperature sensor II
(engine)

F1

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



F2

Engine starts but then dies
Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Air-flow sensor O.K.?

Yes

No

Testing:

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect sensor flap (remove hose between air filter and air-flow sensor).

Test specifications:

0 280 202 017

(with code number
5 or 8):

100...500 Ω

0 280 202 017 and

0 280 202 019...23

(with code number 21):

200...1000 Ω

Checking the pump contact:

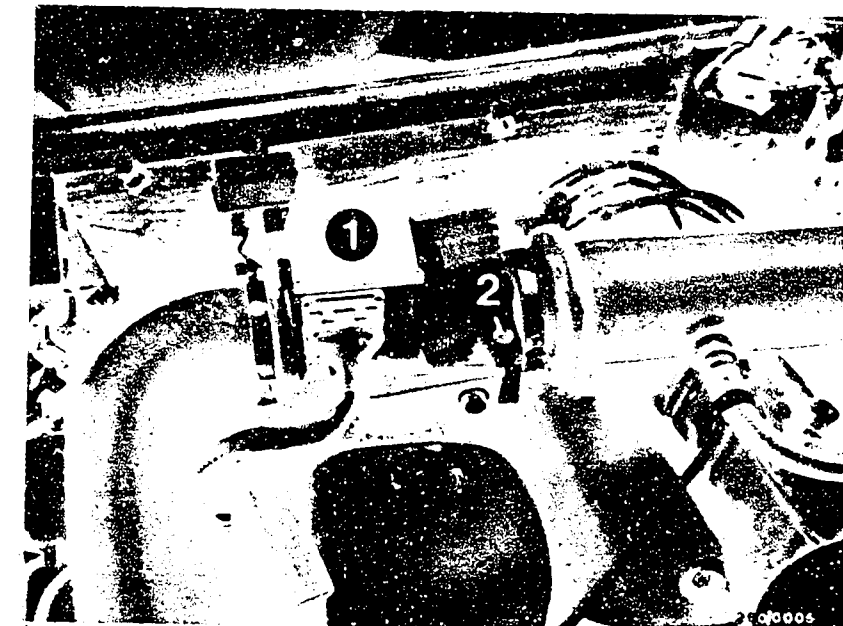
Remove plug from air-flow sensor. Measure resistance between term. 36 and term. 39 using ohmmeter.

Deflect sensor flap.

Set value approx. 0 Ω .

Caution!

When the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight (leaks).

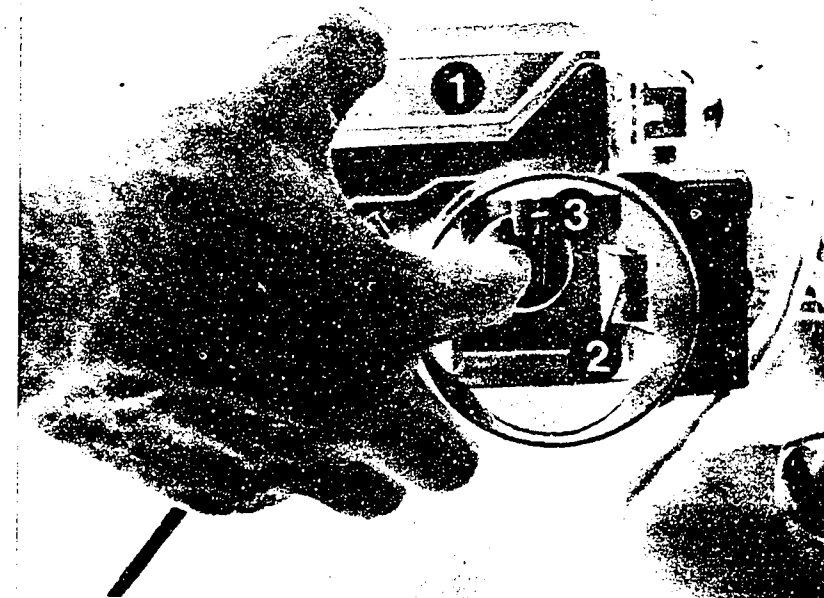


1 = Air-flow sensor

2 = Bypass screw

Turning in clockwise
direction = richer mixture

Pushing open the air-flow
sensor flap



Continued on F 5/F 6

F3

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



F4

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



Engine starts but then dies (continued)

Are all hose lines and electric leads securely attached?
Visual examination. Is the air-intake system leak-tight?

No

Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose connection.

Yes

Testing completed for customer complaint

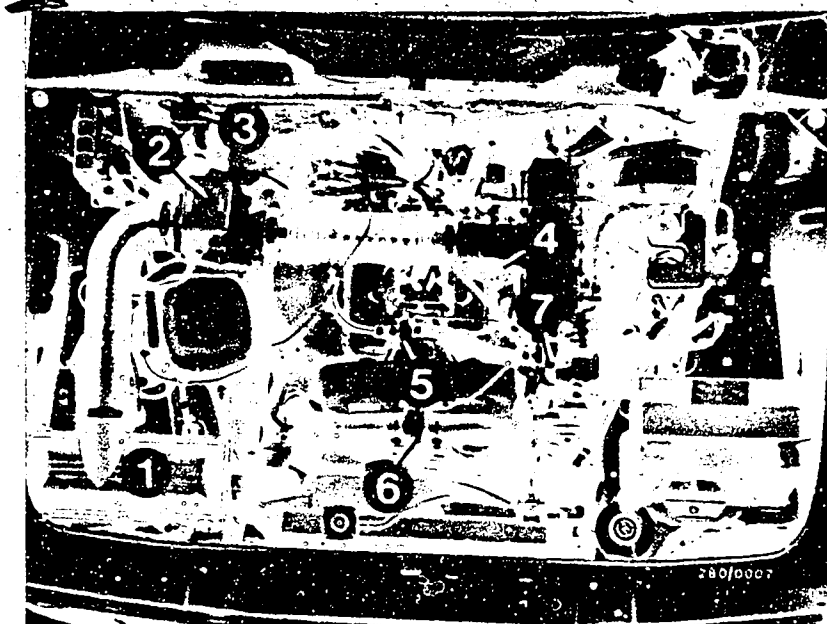
"Engine starts but then dies"

Customer complaint remedied?

No

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (Compression, valve setting, valve timing, worn camshaft).



Overall view of engine

- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Relay set
- 4 = Throttle-valve switch
- 5 = Auxiliary-air device (black plug)
- 6 = Temperature sensor II (white plug)
- 7 = Start valve (blue plug)

F5

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



F6

Engine starts but then dies

Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

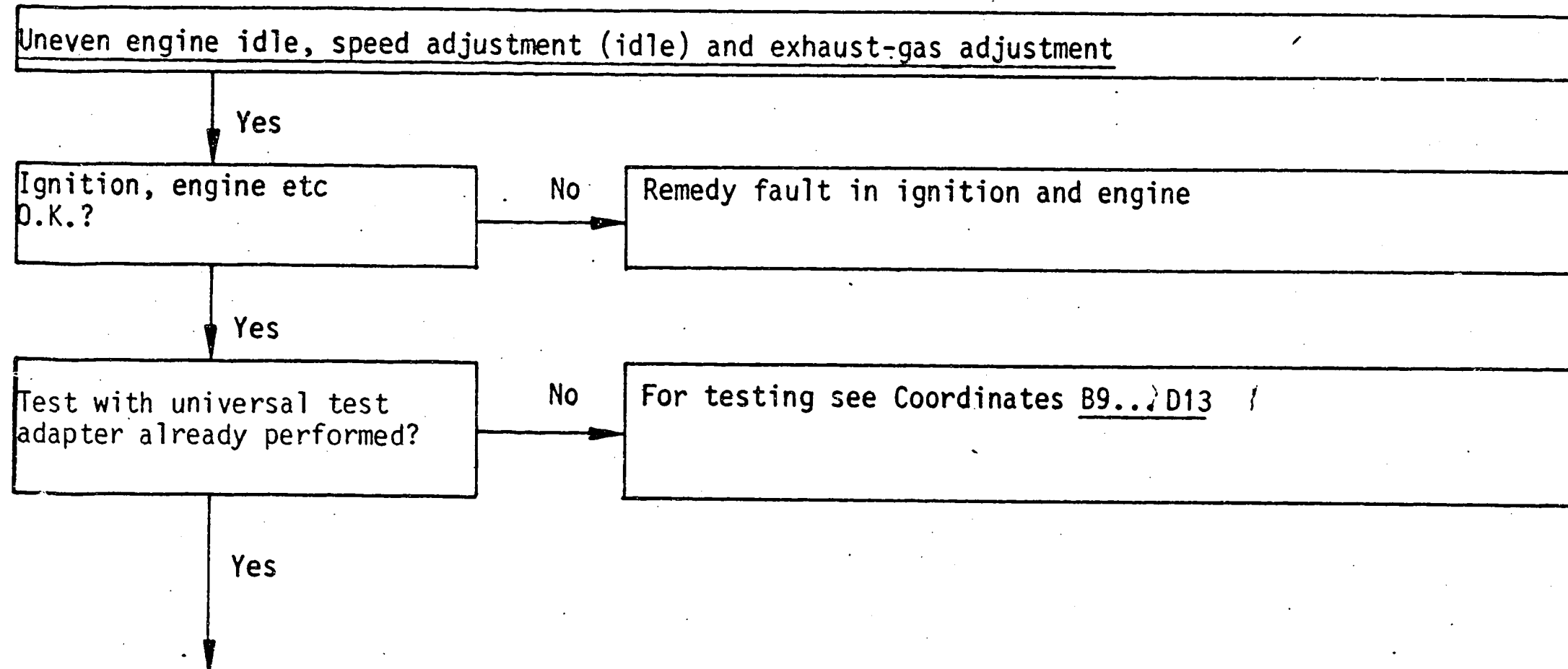
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.



Continued on F 9/F10

F7

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



F8

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (Continued)

Throttle valve
closed?

No

Testing:

Throttle valve closed?

Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.

Adjustment:

Throttle valve must be set just before it sticks with the throttle-valve stop screw. Straighten throttle linkage if bent.

Yes

CO and idle speed
correctly adjusted?

No

CO and idle adjustment

Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted trans-
mission:

$800 \dots 900 \text{ min}^{-1}$

Automatic transmission
(selector lever in
position "D" and hand
brake on):

$700 \dots 800 \text{ min}^{-1}$

CO setting for Fiat 132/Argenta:

$1.5 \dots 2.5 \%$ by vol. CO

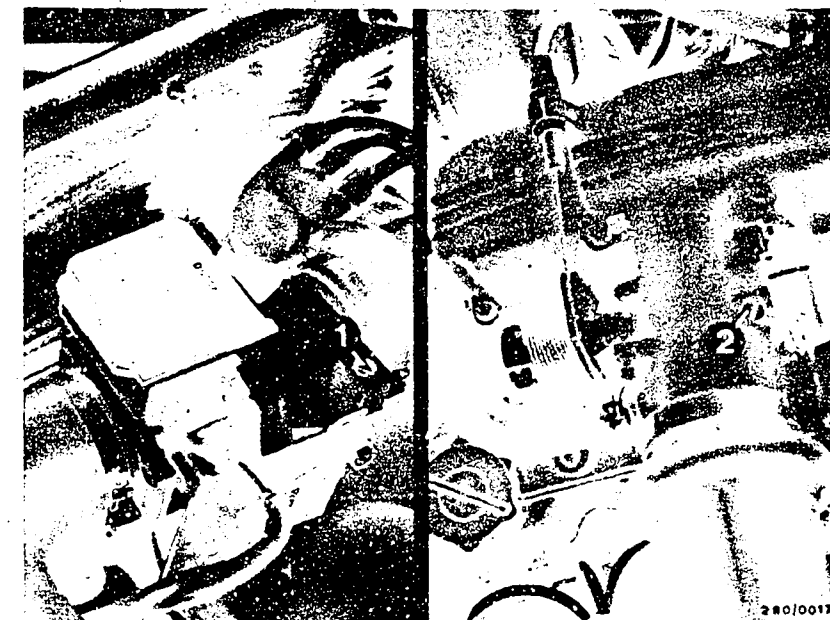
CO setting for Fiat Spider 2000 US

(Lambda sensor disconnected):

Max. 0.8% by vol. CO

Testing the solenoid-operated air valve

Let warmed-up engine idle with the air conditioner (if fitted) switched off. Connect connecting leads on solenoid-operated air valve to battery voltage. Engine speed is increased by approx. 150 min^{-1} . If there is no change in engine speed, replace the solenoid-operated air valve.

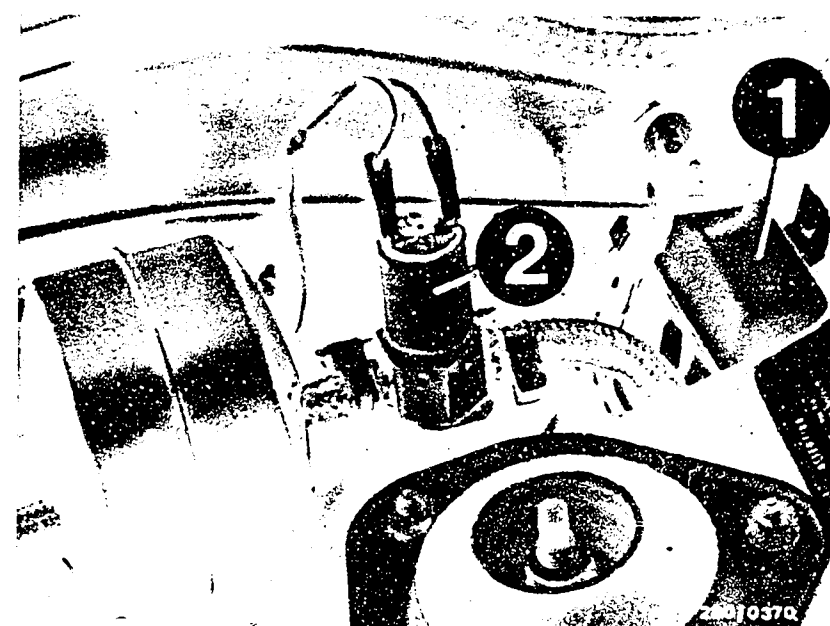


1 = CO adjusting screw

2 = Idle-speed-adjusting screw

1 = Relay set

2 = Solenoid-operated air valve



Continued on F11/F12

F9

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US

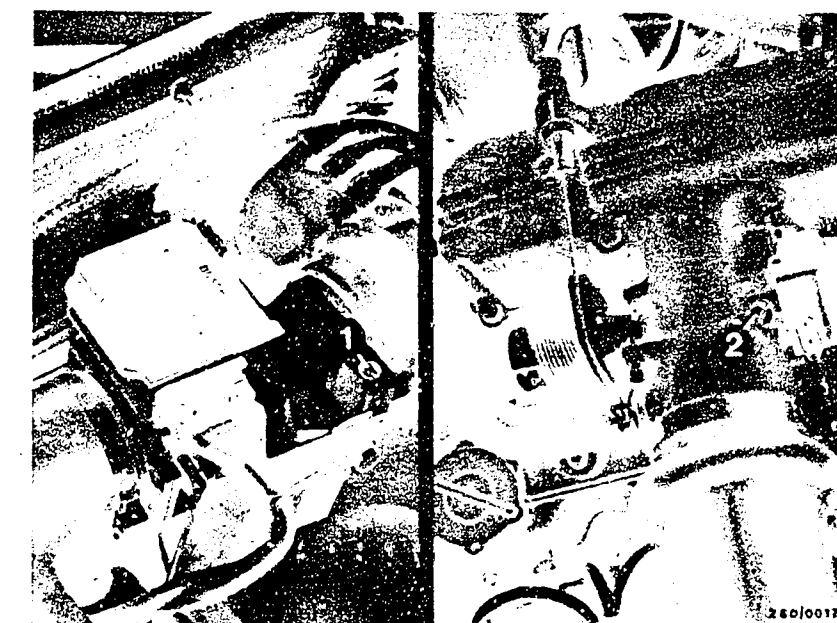
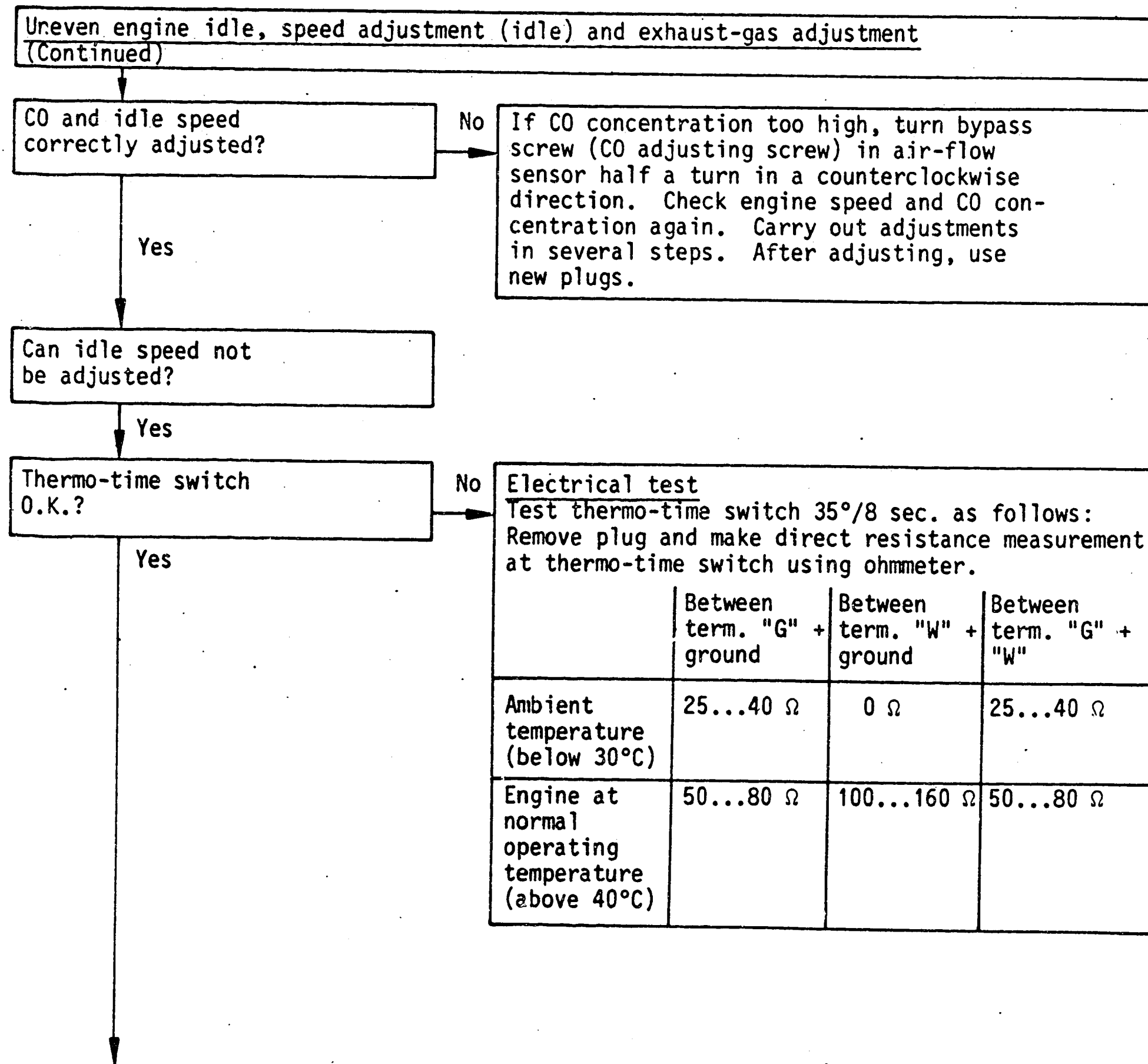


F10

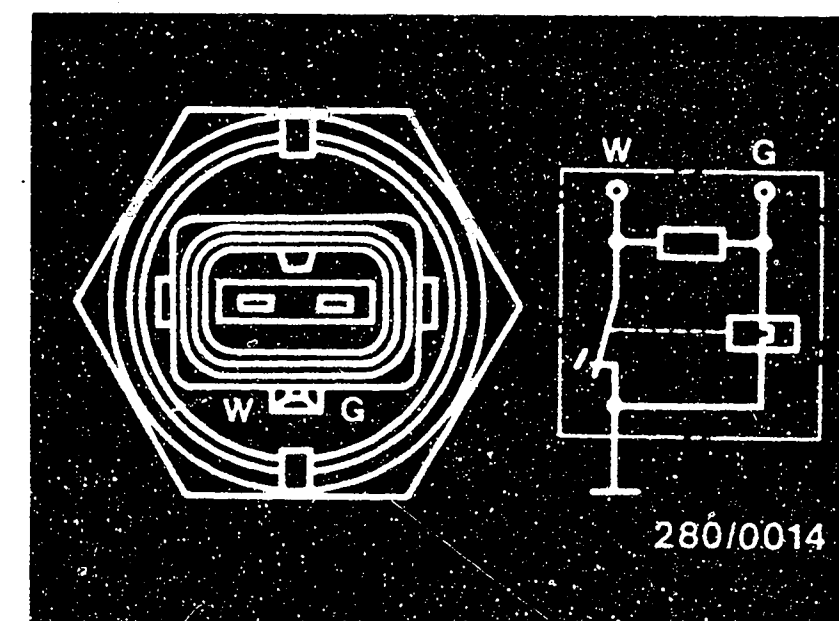
Uneven engine idle

Fiat 132/Argenta/Spider 2000 US





1 = CO adjusting screw
2 = Idle-speed-adjusting screw



Continued on F13/F14

F11

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



F12

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

Start valve
O.K.?

No

Testing the start valve for leaks:

1. When installed

Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.

2. When removed

Remove start valve (Caution! Fire hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (remove hose between air filter and air-flow sensor. Ignition "ON" and deflect air-flow sensor flap).

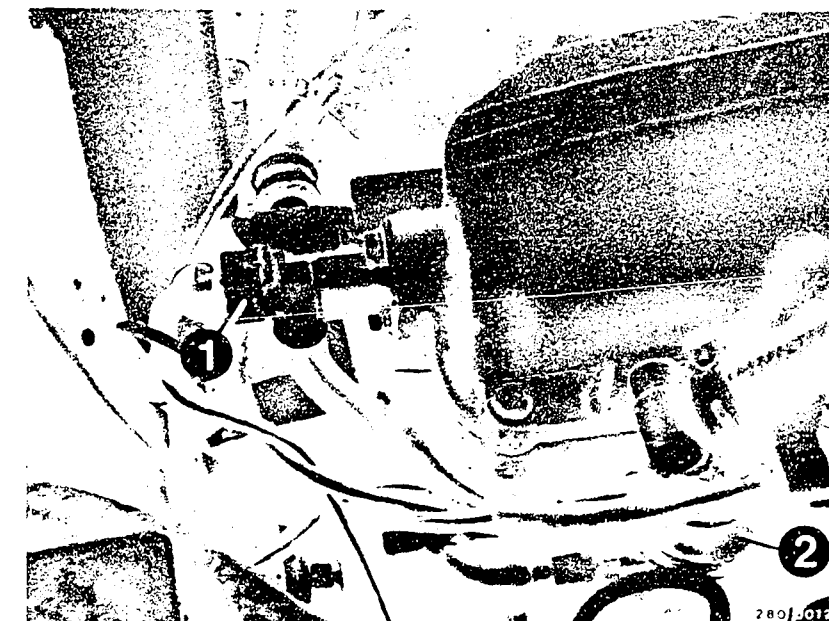
Test specification: Within one minute max.
1 drop may form at the mouth of the valve.

Caution!

After the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight.

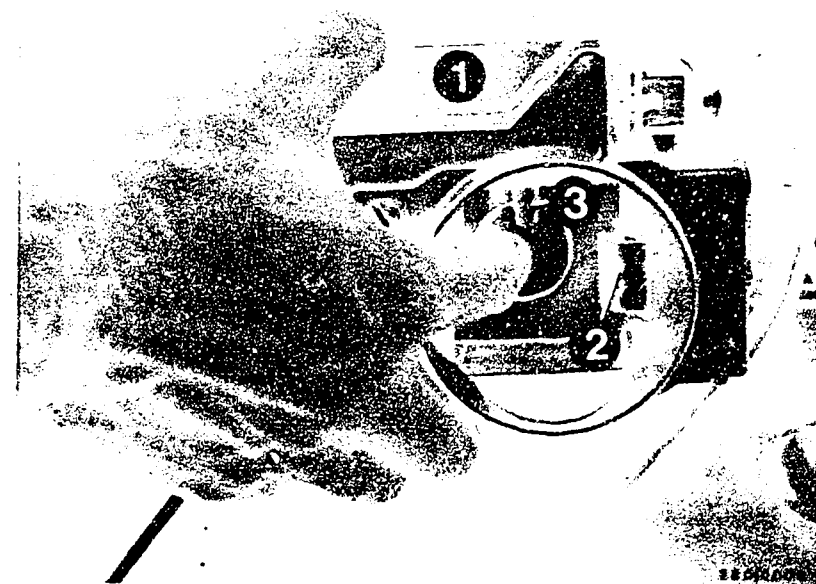
Yes

Continued on F15/F16



1 = Start valve
2 = Pressure regulator

Opening the air-flow sensor flap



F13

Uneven engine idle

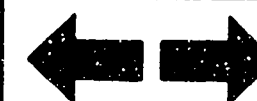
Fiat 132/Argenta/Spider 2000 US



F14

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

Auxiliary-air device
tested? (Mechanically
O.K.?)

No

Testing:

1. Visual examination of auxiliary-air device:
When cold, the device must be open; when the engine is warm, it must be closed. If not, replace auxiliary-air device. (Remove hoses and look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With the engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop. If incorrect, replace auxiliary-air device (pay attention to direction of flow).

Yes

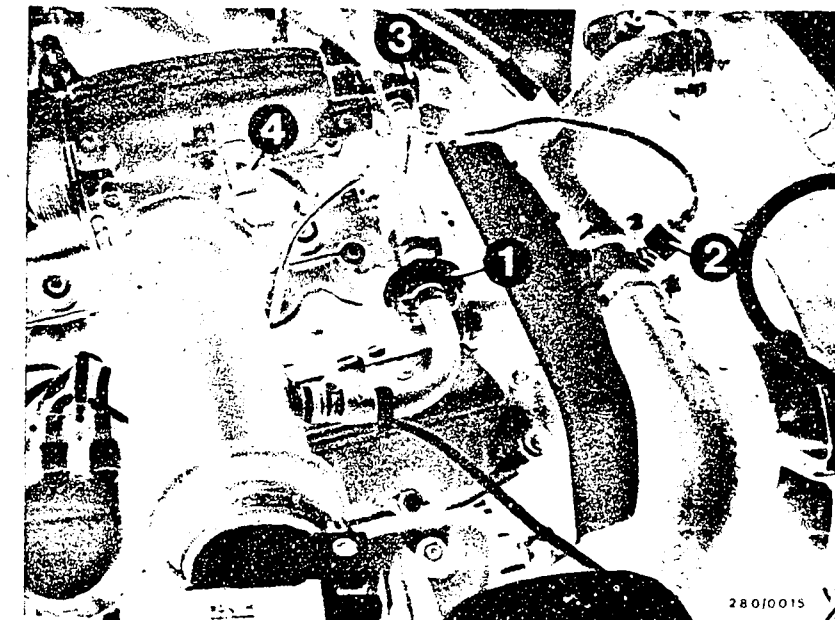
Injection valve
mechanically O.K.?

No

With the engine running, disconnect the injection valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve is O.K. Test for continuity in connecting leads from relay set term. 88b, term. 88e via the injection valves to control unit term. 14, 15, 32 and 33. If necessary, replace leads or solenoid-operated injection valves.

Yes

Continued on F17/F18



- 1 = Auxiliary-air device
2 = Temperature sensor II
(engine)

F15

Uneven engine idle
Fiat 132/Argenta/Spider 2000 US



F16

Uneven engine idle
Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

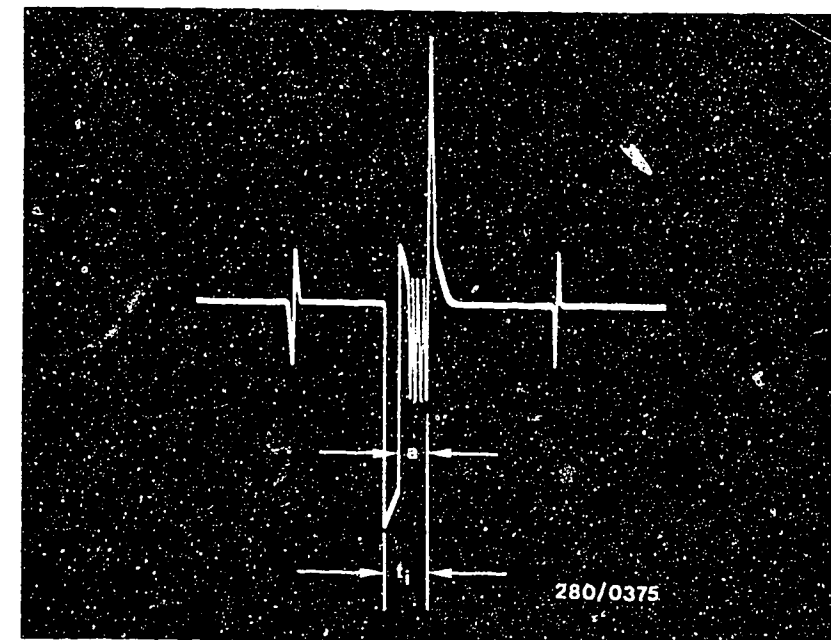
Injection valves checked
for proper operation?

No

Connect the test lead as follows:
The two-pole plug connectors of the test lead are connected between an injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.
When the correct terminal is connected, the diagram shown opposite is visible.
Using the test lead, the injection pulses at the injection valves can be tested with an ignition oscilloscope with the engine running.
If the diagram opposite is not obtained or if there are deviations (interference, missing etc), the other injection valves should also be tested.
In case of interference → check routing of leads.
In case of missing → eliminate loose contacts in leads or in plug-in connections.

Yes

Continued on F19/F20



Injection pulse of a current-regulated output stage.
(Measured at the injection valve)
 a = Length of regulation
(dependent on the engine load)

t_i = Injection pulse

At idle with the engine at no load the current regulation a is not yet visible on the oscilloscope.

F17

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



F18

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

Air-flow sensor
O.K.?

No

Testing:

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohm-meter to term. 7 and term. 8 of air-flow sensor. Remove hose between air filter and air-flow sensor. Deflect sensor flap. Measure resistance.

Test specifications:

0 280 202 017
(with code number
5 or 8):

100...500 Ω

0 280 202 017 and
0 280 202 019...23
(with code number 21):

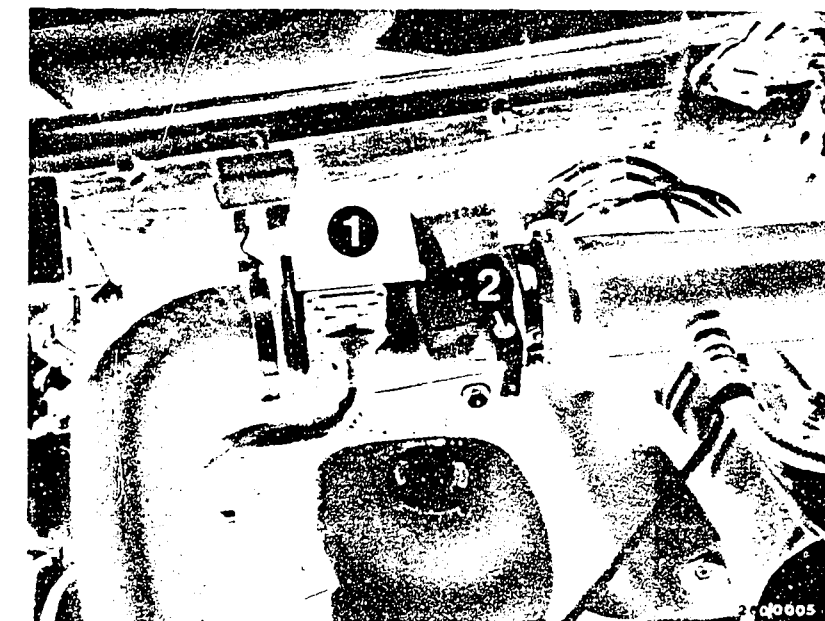
200...1000 Ω

Caution!

When the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight.

Yes

Continued on F21/F22

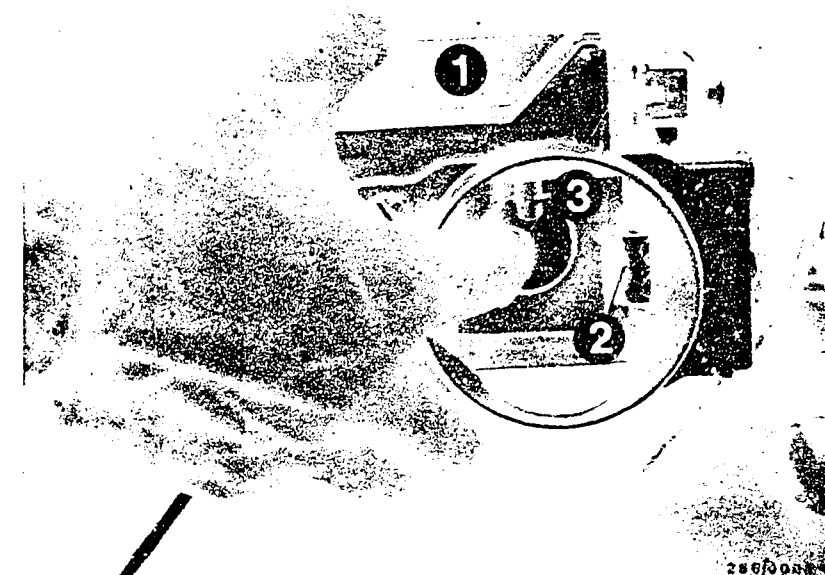


1 = Air-flow sensor

2 = Bypass screw
(CO adjustment)

Turning in clockwise direction =
richer mixture

Pushing open the air-flow sensor
flap



F19

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



F20

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

Fuel pressure O.K.?

Test specification
1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification
reached?

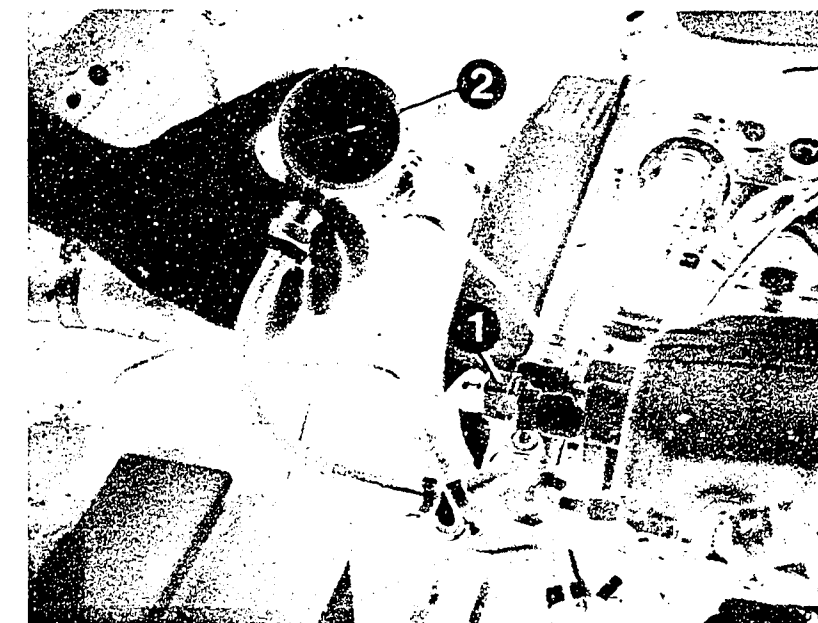
No

Testing: Remove hose from start valve.
Connect pressure gauge.
Caution: When removing the fuel hose
make sure that no fuel gets onto hot
parts of the engine.

Yes

Yes

Continued on G 1/G 2



1 = Start valve
2 = Pressure gauge

F21

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



F22

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (Continued)

Fuel pressure O.K.?

Test specification
1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

Yes

No

Testing the fuel pressure

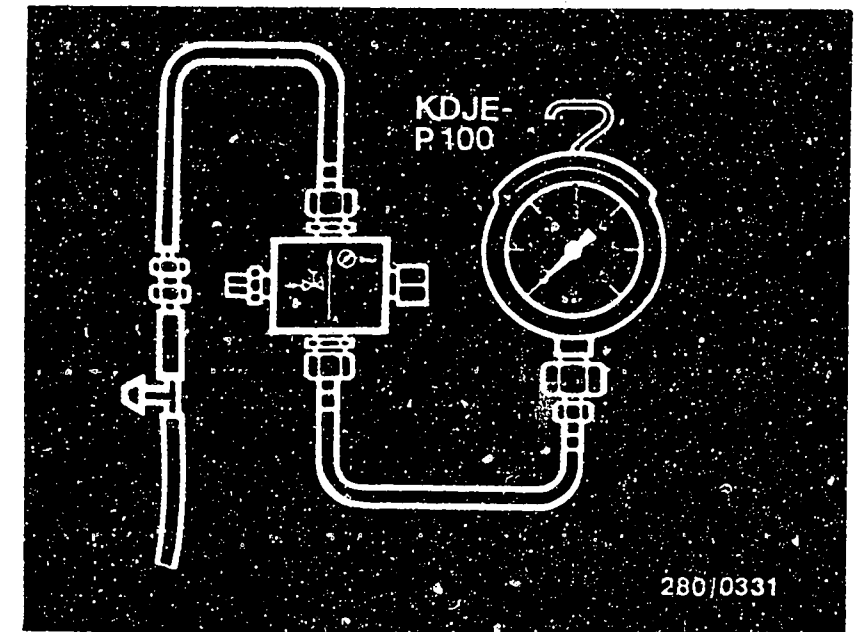
Connect the connections of the pressure testers into the fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw. Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the fuel-distribution pipe. Make sure there are no leaks. Remove hose between air filter and air-flow sensor. Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close). Fuel pump must operate.

Fuel pump pressure
Fiat 132/Argenta
2.8...3.2 bar

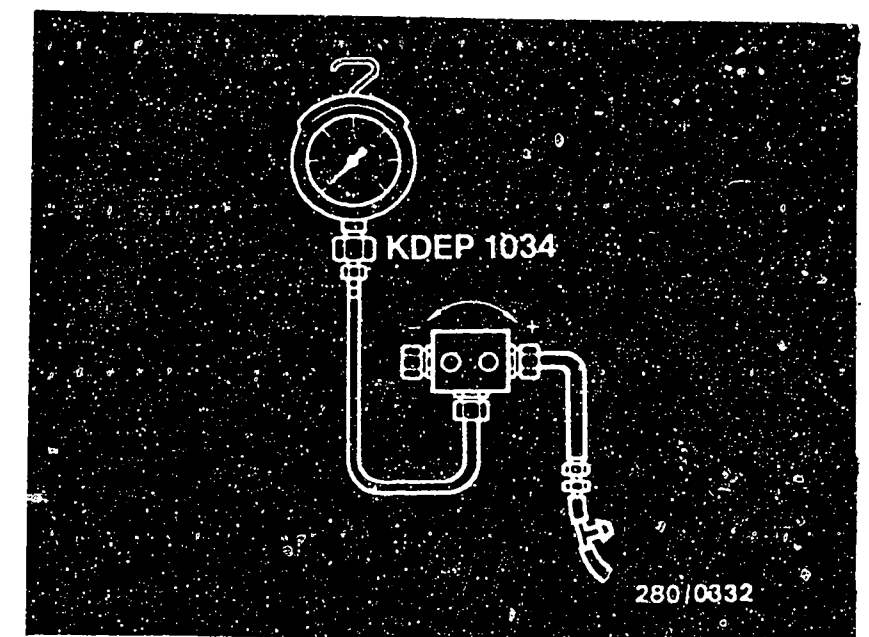
Fiat Spider 2000 US
2.3...2.7 bar

Let engine idle → fuel pump pressure approx. 2.5 bar (132/Argenta) and 2.0 bar (Spider 2000 US).

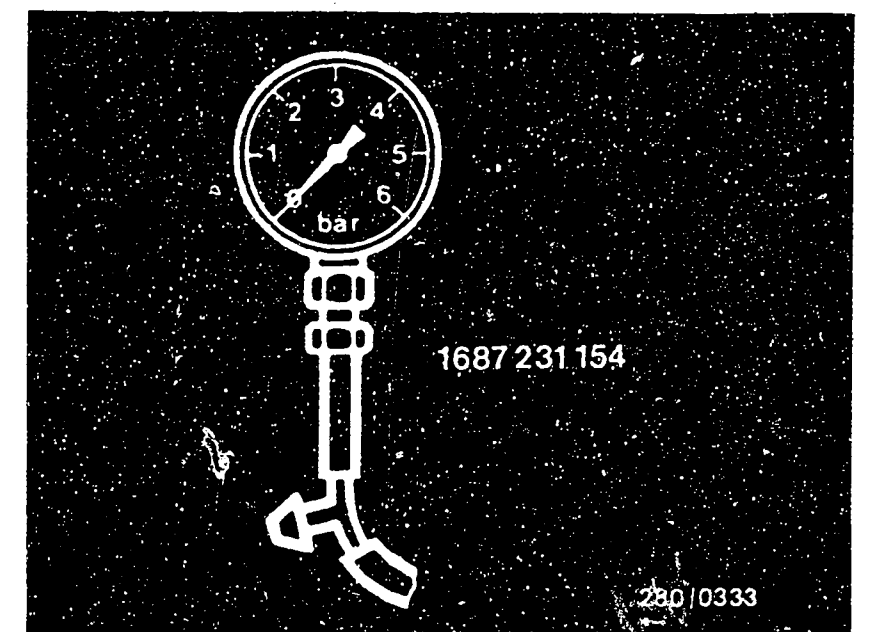
Continued on G 3/G 4



280/0331



280/0332



280/0333

G1

Uneven engine idle
Fiat 132/Argenta/Spider 2000 US



G2

Uneven engine idle
Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Pressure regulator O.K.?
Test specification reached?

No

Yes

Testing the pressure regulator

Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close).
Electric fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta

2.8...3.2 bar

Fiat Spider 2000 US

2.3...2.7 bar

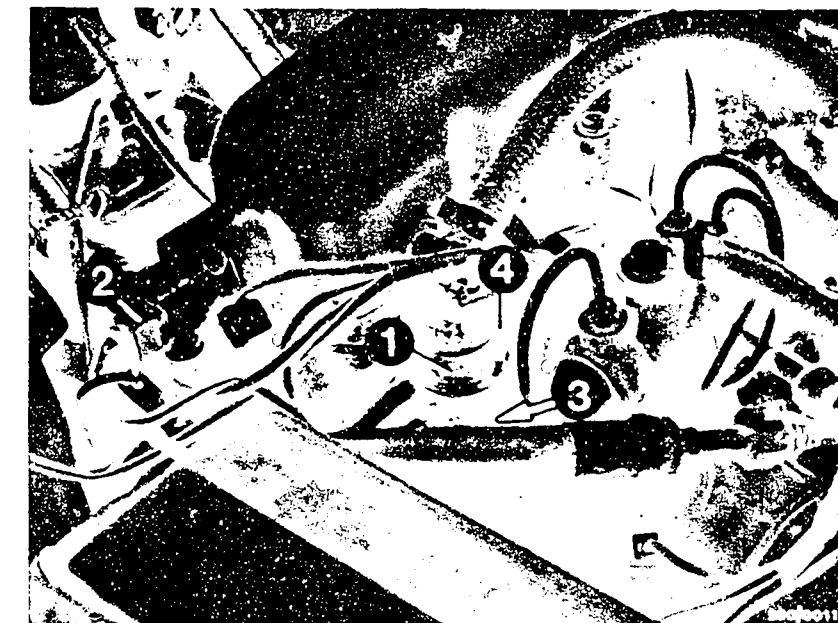
Fuel pressure of 2.8 bar (132/Argenta) or
2.3 bar (Spider 2000 US) not reached:

1. Slowly pinch off return line.
(Caution: Do not load pressure gauge above 6 bar).
Pressure rises above 4 bar → replace pressure regulator.
Pressure remains below 4 bar → replace fuel pump.
2. Check fuel delivery line and fuel filter for throughflow.
3. Strainer in tank clogged.
4. Corrosion in tank.

Fuel pressure of 3.2 bar (132/Argenta) or
2.7 bar (Spider 2000 US) exceeded:

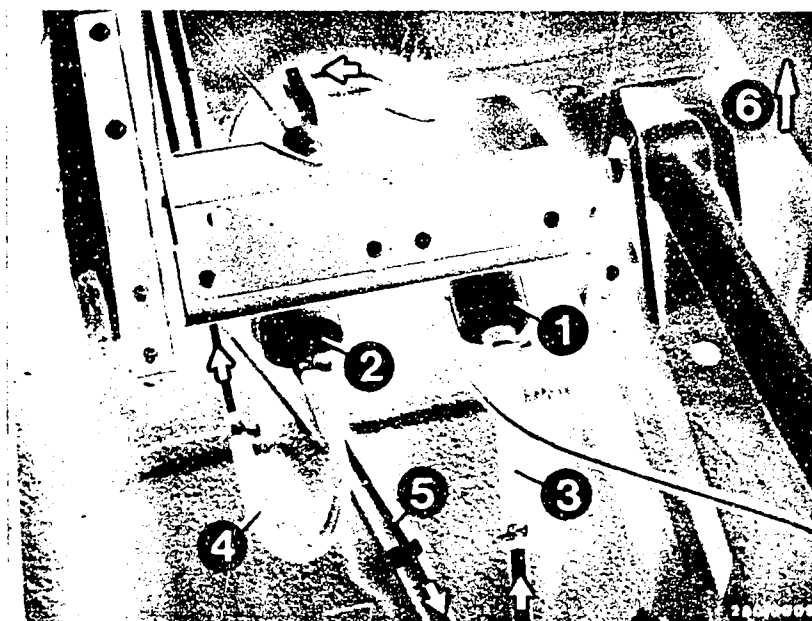
1. Fuel return line clogged or pinched.
2. Replace pressure regulator.

Fit hose between air filter and air-flow sensor and tighten hose clamp (leaks).



1 = Pressure regulator
3 = Fuel return line

1 = Electric fuel pump
2 = Fuel filter
3 = Fuel inlet line
4 = Fuel delivery line
5 = Fuel return line
6 = Forwards travel
Arrow: Direction of fuel return



Continued on G 5/G 6

G3

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



G4

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

Are all hose lines and electric leads securely attached?
Visual examination. Is the air-intake system leak-tight?

No

Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

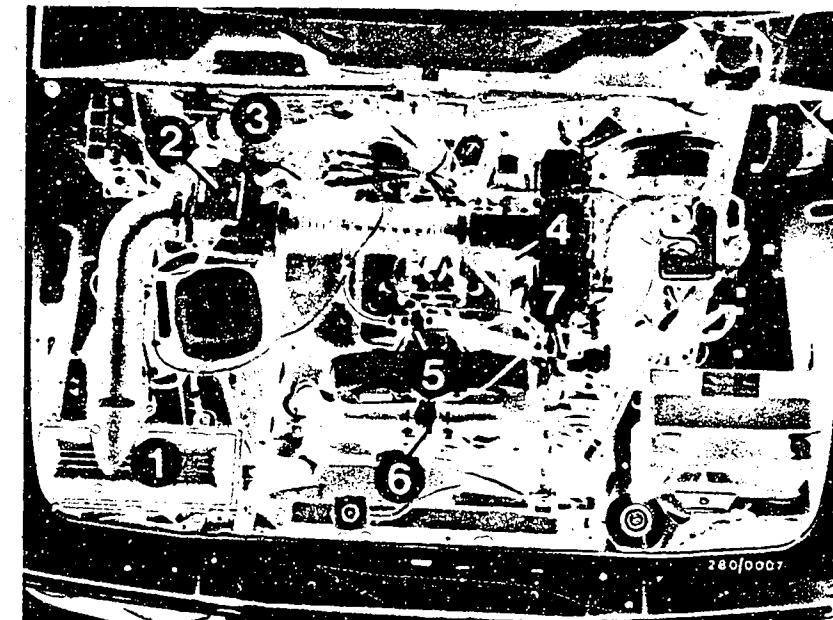
Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose connection.

Yes

Continued on G 7/G 8



Overall view of engine

- 1 = Air-filter
- 2 = Air-flow sensor
- 3 = Relay set
- 4 = Throttle-valve switch
- 5 = Auxiliary-air device (black plug)
- 6 = Temperature sensor II (white plug)
- 7 = Start valve (blue plug)

G5

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



G6

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (Continued)

CO and idle speed
correctly adjusted?
Repeat
Solenoid-operated air
valve O.K.?

No

CO and idle adjustment

Exhaust-gas test with CO analyzer with
engine at normal operating temperature
and at idle speed.

Idle speed

Manually-shifted transmission: $800 \dots 900 \text{ min}^{-1}$

Automatic transmission

(selector lever in
position "D" and handbrake
on):

$700 \dots 800 \text{ min}^{-1}$

CO setting for Fiat 132/Argenta:

$1.5 \dots 2.5 \%$ by vol. CO

CO setting for Fiat Spider 2000 US:

(Lambda sensor disconnected)

Max. 0.8% by vol. CO

Testing the solenoid-operated air valve:

Let warmed-up engine idle with the air
conditioner (if fitted) switched off.

Connect connecting leads on solenoid-
operated air valve to battery voltage.

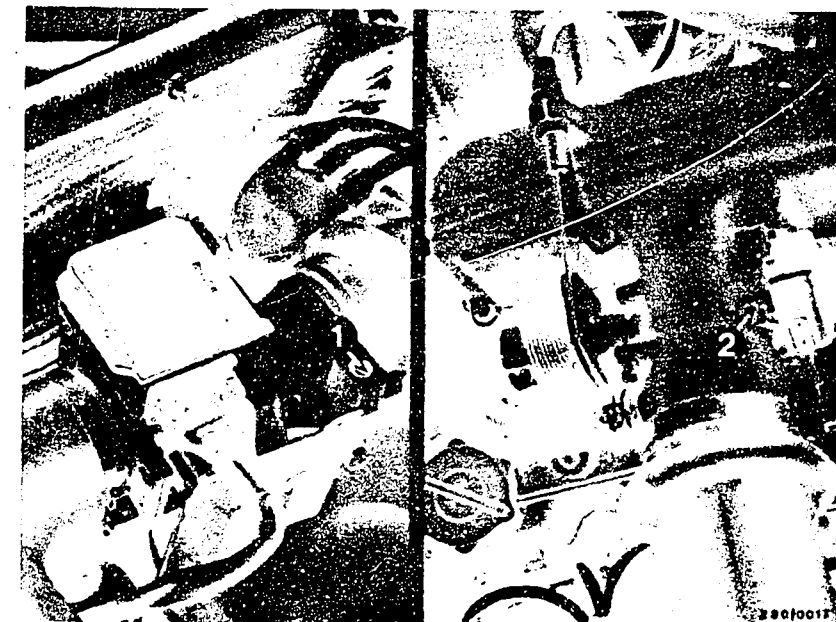
Engine speed is increased by approx.

150 min^{-1} . If there is no change in engine
speed, replace the solenoid-operated air
valve.

If CO concentration too high, turn bypass
screw (CO adjusting screw) in air-flow
sensor half a turn in a counterclockwise
direction. Check engine speed and CO con-
centration again. Carry out adjustments in
several steps. After adjusting, use new
plugs.

Yes

Continued on G 9/G10

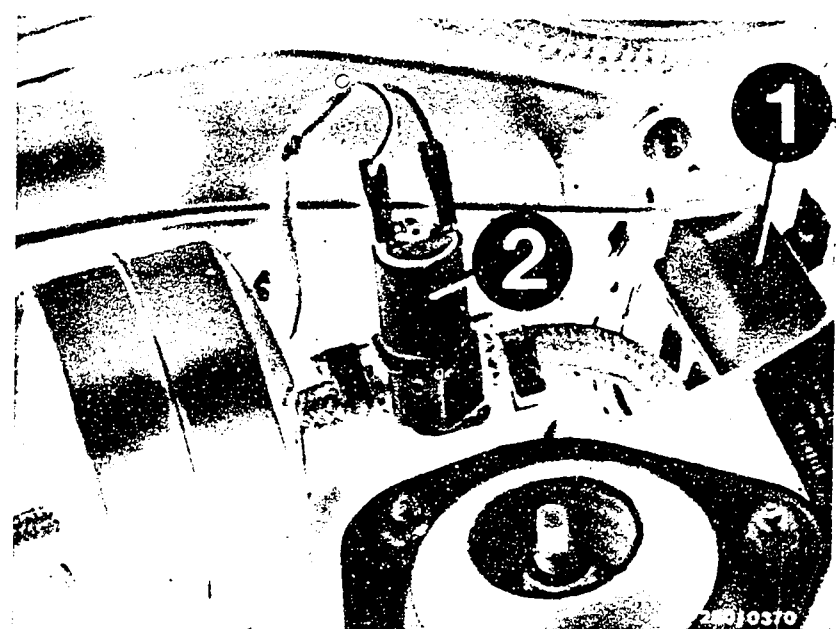


1 = CO adjusting screw

2 = Idle-speed-adjusting screw

1 = Relay set

2 = Solenoid-operated air valve



G7

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



G8

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(Continued)

Testing completed for
customer complaint

"Uneven engine idle"

Customer complaint
remedied?

No

Further possibilities:

- Customer complaint incorrectly diagnosed
(see Coordinates B3...B8).
If the fault has not been detected by
"direct trouble-shooting", see "detailed
trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K.
(Compression, valve setting, valve timing,
worn camshaft).

G9

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



G10

Uneven engine idle

Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

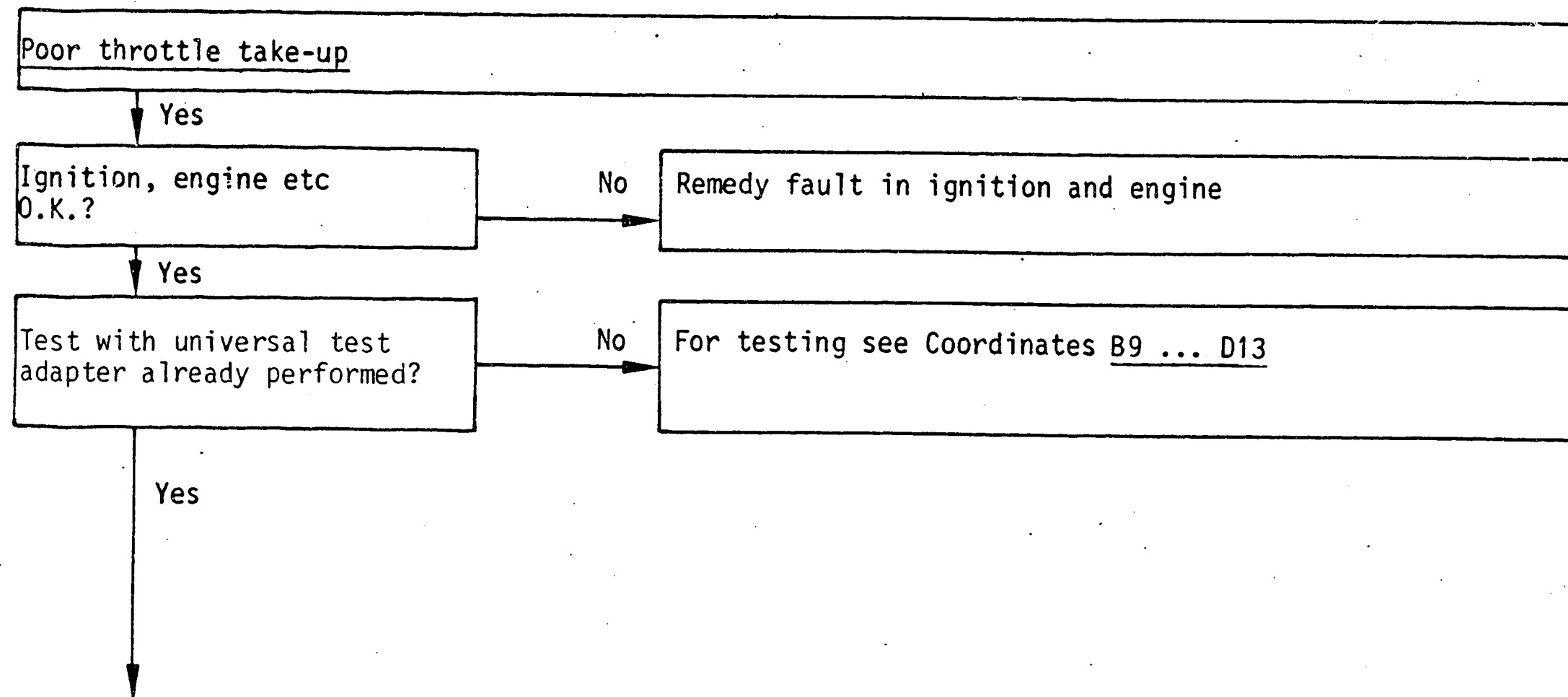
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.



Continued on G13/G14

G11

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



G12

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



Poor throttle take-up (continued)

Auxiliary-air device tested?
(Mechanically O.K.?)

No

Testing:

1. Visual examination of auxiliary-air device:
When cold, the device must be open; when the engine is warm, it must be closed. If not, replace auxiliary-air device. (Remove hoses and look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With the engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop. If incorrect, replace auxiliary-air device (pay attention to direction of flow).

Yes

Air-flow sensor
O.K.?

No

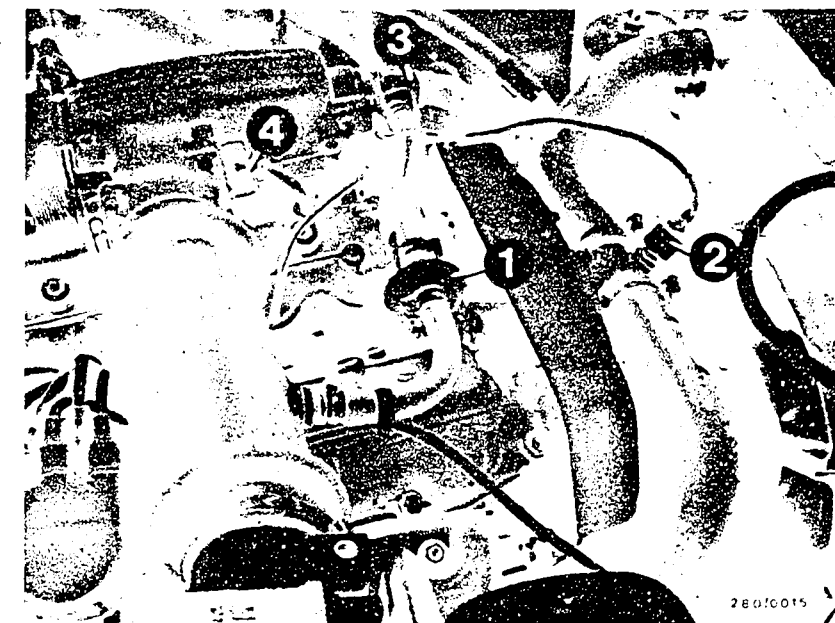
Testing:

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor.

Yes

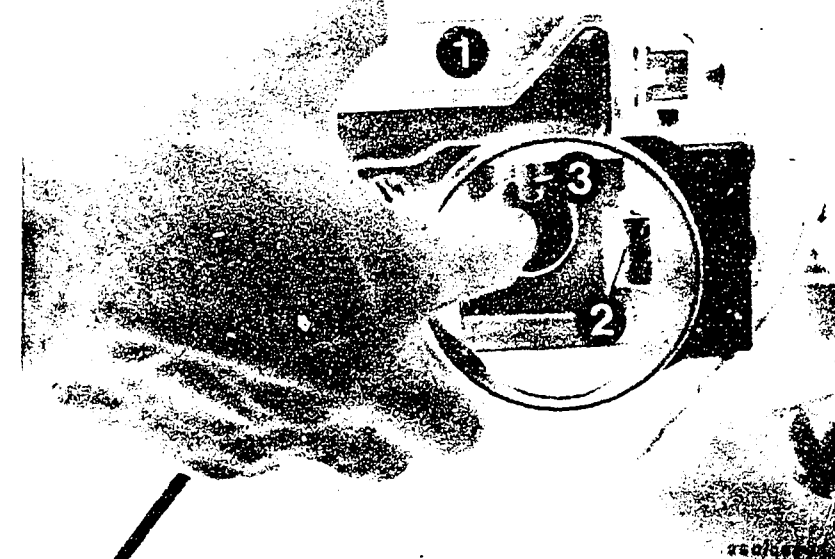
Yes

Continued on G15/G16



1 = Auxiliary-air device
2 = Temperature sensor II
(engine)

Pushing open the air-flow sensor flap



G13

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



G14

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



Poor throttle take-up (continued)

Air-flow sensor
O.K.?

No

Electrical test:

Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Remove hose between air filter and air-flow sensor. Deflect sensor flap. Measure resistance.

Test specification:

0 280 202 017

(with code number
5 or 8):

100...500 Ω

0 280 202 019...023

(with code number 21):

200...1000 Ω

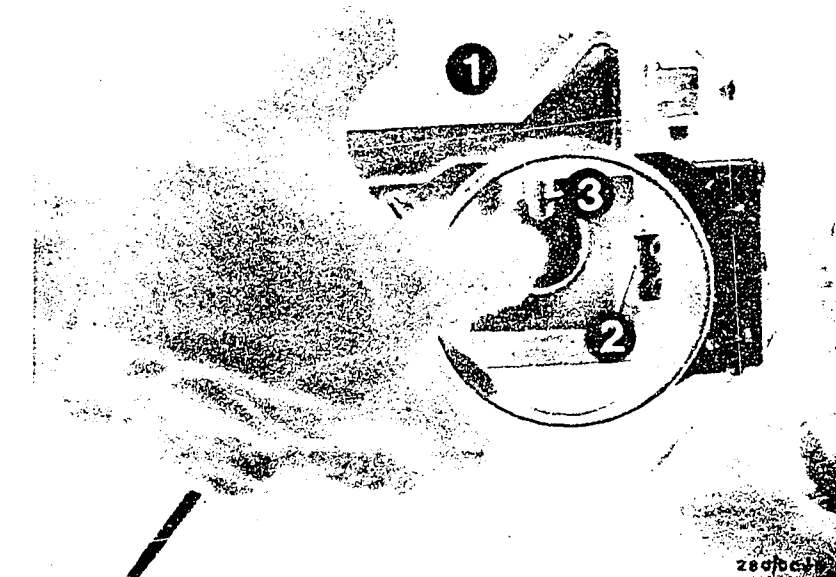
Potentiometer test (noise test)

Remove hose between air filter and air-flow sensor. Leave plug on. Set motortester to "special input" and connect, using special cable, to air-flow sensor term. 7 (red clip) and term. 6 (black clip). Set control lever for image adjustment on motortester as far as it will go to the left (calibrated setting). Ignition "ON", deflect air-flow sensor flap suddenly (several times). If incorrect (see illustration) → replace air-flow sensor.

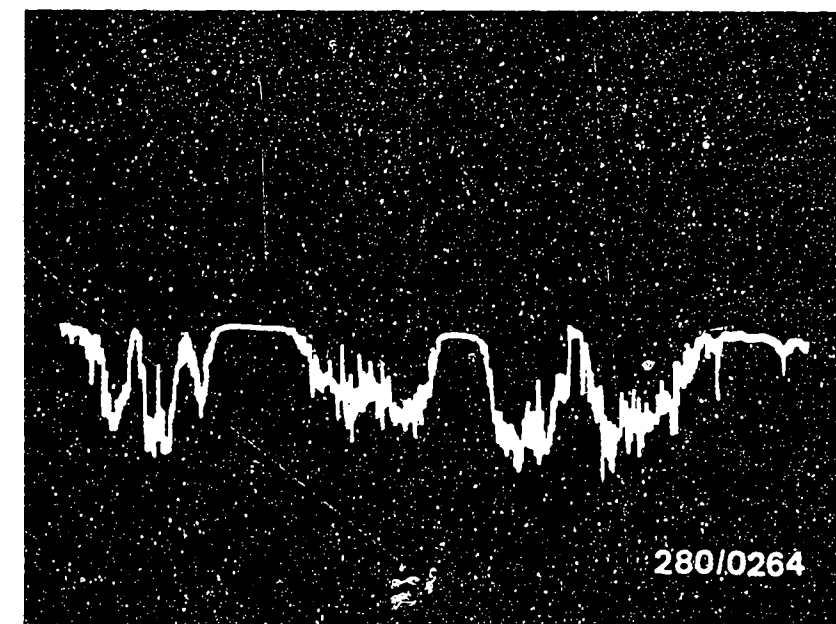
Caution!

After testing is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure that hose clamp is tight. Do not bend any terminals in the plug.

Yes



Pushing open the air-flow sensor flap.



Continued on G17/G18

G15

Poor throttle take-up

Fiat 132/Argenta/Spider 2000 US



G16

Poor throttle take-up

Fiat 132/Argenta/Spider 2000 US



Poor throttle take-up (continued)

Solenoid-operated injection valves tested for proper operation?

no

Connect the test lead as follows:

The two-pole plug connectors of the test lead are connected between a solenoid-operated injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.

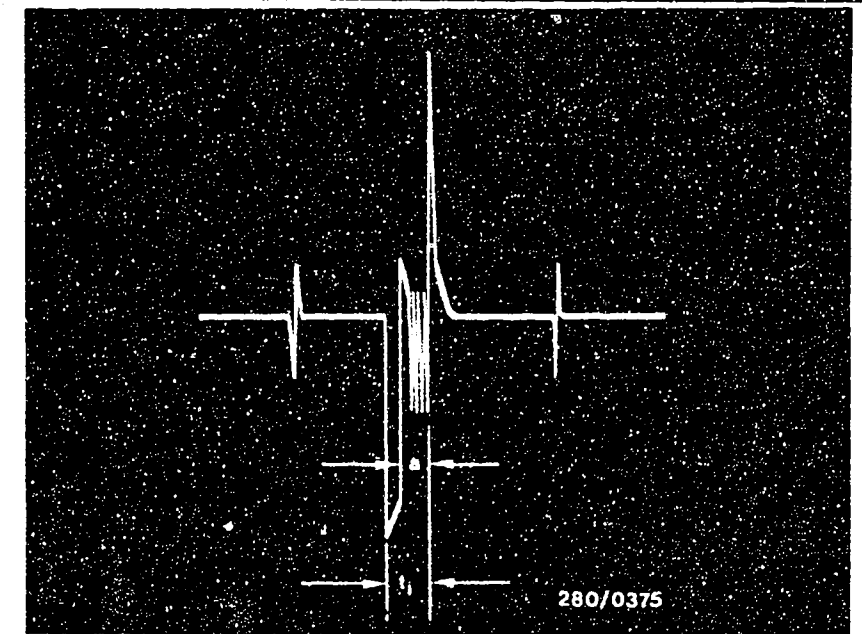
When the correct terminal is connected, the picture opposite can be seen on the oscilloscope.

With the aid of the test lead it is possible with an ignition oscilloscope to test the injection pulses at the injection valves with the engine running. If the picture opposite is not obtained or if there are deviations (interference, missing etc.), the other injection valves should also be tested.

In case of interference → check routing of the leads.
In case of missing → remedy loose contacts in leads or in plug-in connections.

yes

Continued on G19/G20



Injection pulse of a current-regulated output stage (measured at the injection valve).

a = Length of regulation (depends on engine load)

ti = Injection pulse

At idle without any load on the engine the current regulation a is not yet visible on the oscilloscope.

G17

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



G18

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



Poor throttle take-up (continued)

Are all hose lines and electric leads securely attached?
Visual examination. Is the air-intake system leak-tight?

No

Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

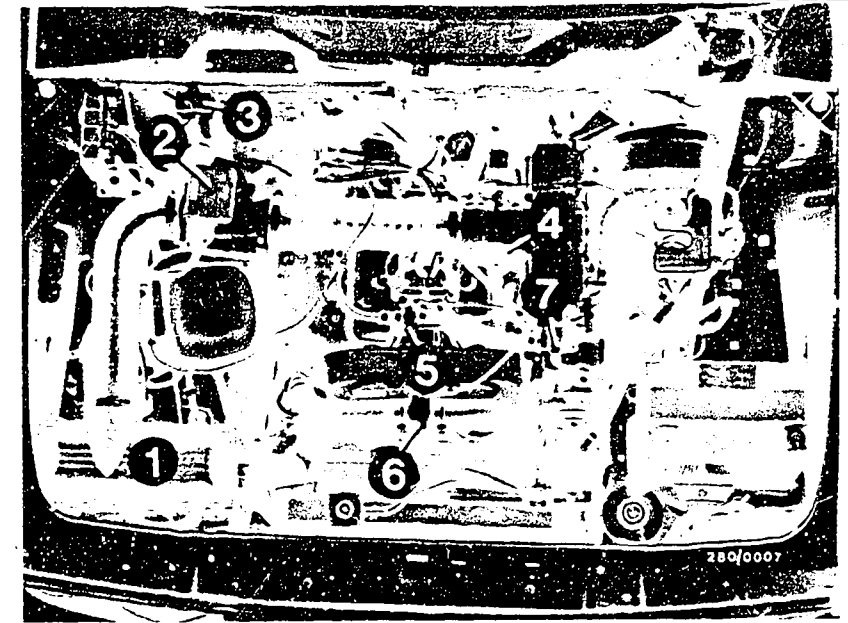
Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose connection.

Yes

Continued on G21/G22



Overall view of engine

- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Relay set
- 4 = Throttle-valve switch
- 5 = Auxiliary-air device (black plug)
- 6 = Temperature sensor II (white plug)
- 7 = Start valve (blue plug)

G 19

Poor throttle take-up

Fiat 132/Argenta/Spider 2000 US



G 20

Poor throttle take-up

Fiat 132/Argenta/Spider 2000 US



Poor throttle take-up (continued)

Throttle valve closed?

No

Testing:

Throttle valve closed?

Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.

Adjustment:

Throttle valve must be set just before it sticks with the throttle-valve stop screw. Straighten throttle linkage if bent.

Yes

CO and idle speed correctly adjusted?
Solenoid-operated air valve O.K.?

No

CO and idle adjustment

Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted transmission:

800...900 min⁻¹

Automatic transmission (selector lever in position "D" and hand-brake on):

700...800 min⁻¹

CO setting for Fiat 132/Argenta:

1.5...2.5 % by vol. CO

CO setting for Fiat Spider 2000 US

(Lambda sensor disconnected):

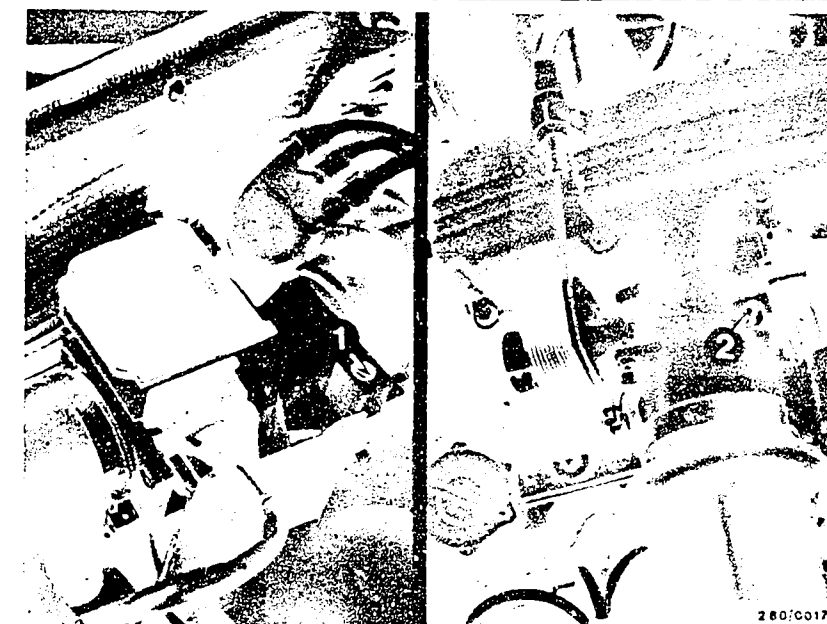
Max. 0.8 % by vol. CO

Testing the solenoid-operated air valve

Let warmed-up engine idle with the air conditioner (if fitted) switched off. Connect connecting leads on solenoid-operated air valve to battery voltage. Engine speed is increased by approx. 150 min⁻¹. If there is no change in engine speed, replace the solenoid-operated air valve.

Yes

Continued on H 1/H 2

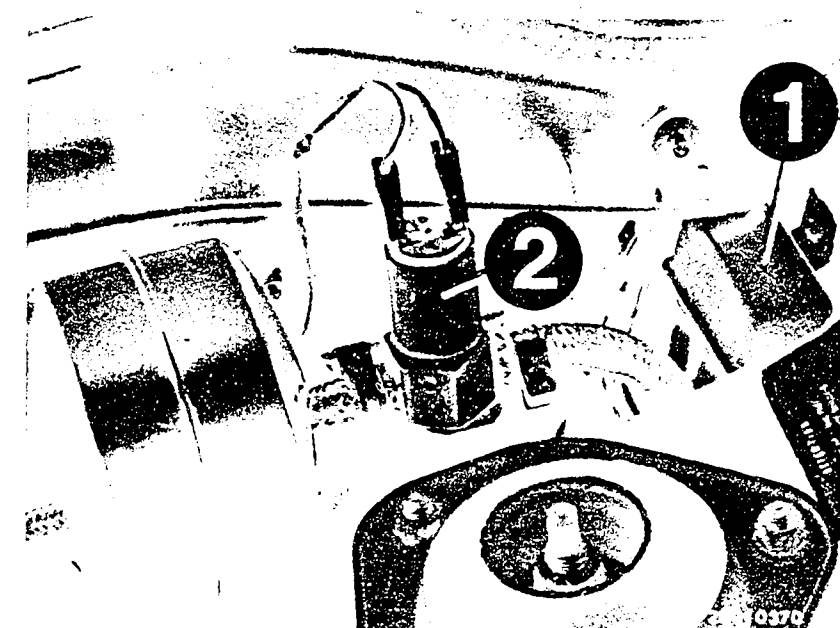


1 = CO adjusting screw

2 = Idle-speed-adjusting screw

1 = Relay set

2 = Solenoid-operated air valve



G 21

Poor throttle take-up

Fiat 132/Argenta/Spider 2000 US

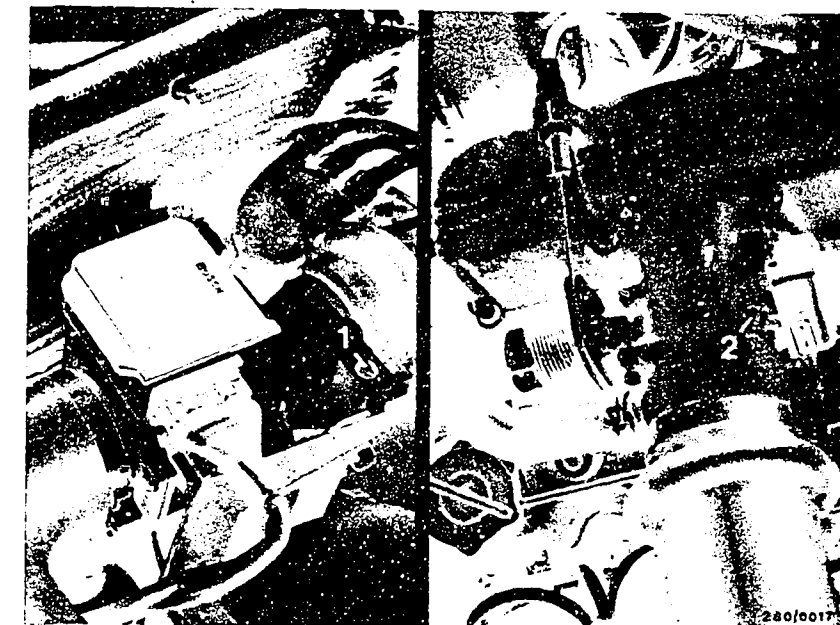
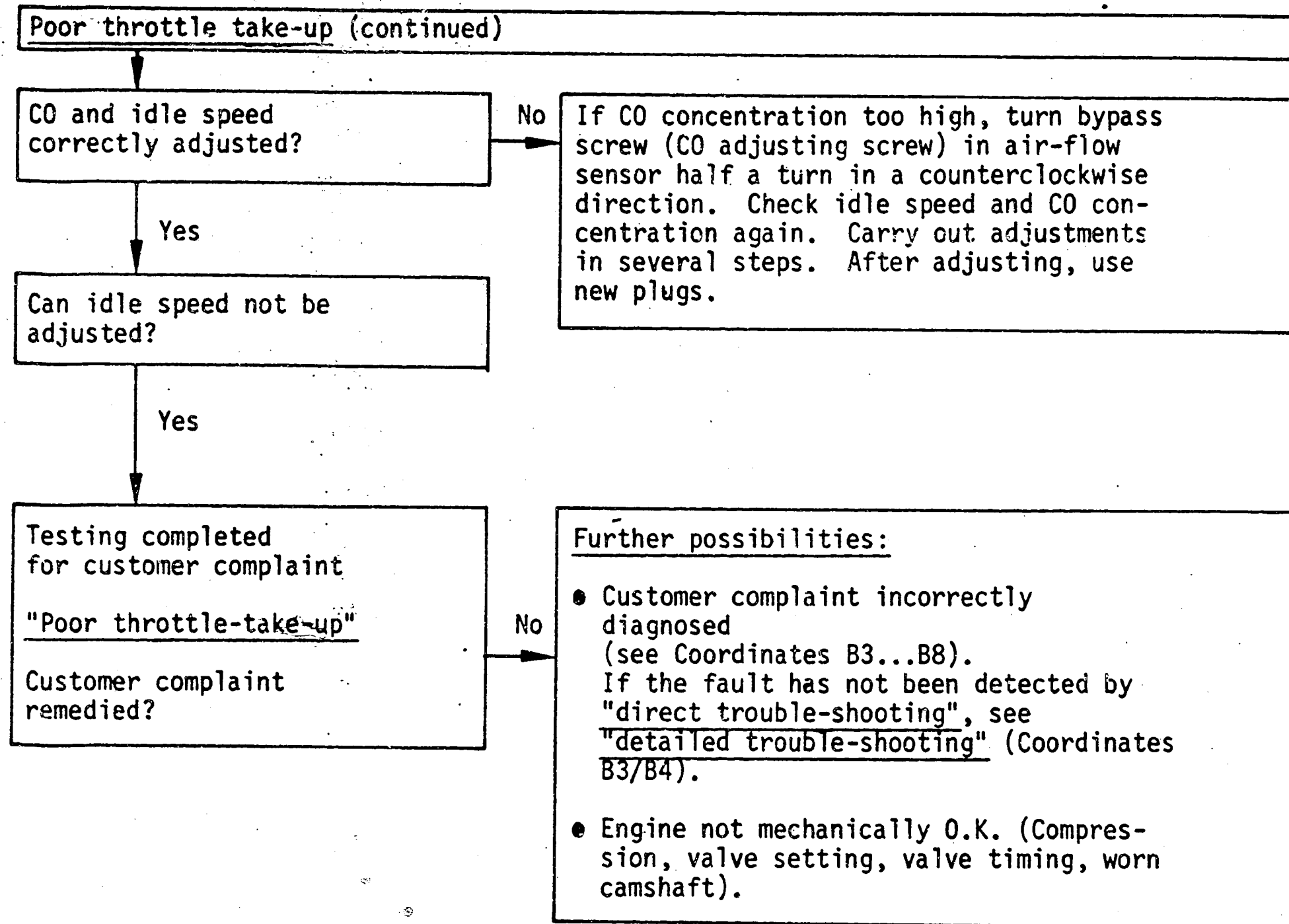


G 22

Poor throttle take-up

Fiat 132/Argenta/Spider 2000 US





1 = CO adjusting screw
2 = Idle-speed-adjusting screw

H1

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



H2

Poor throttle take-up
Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

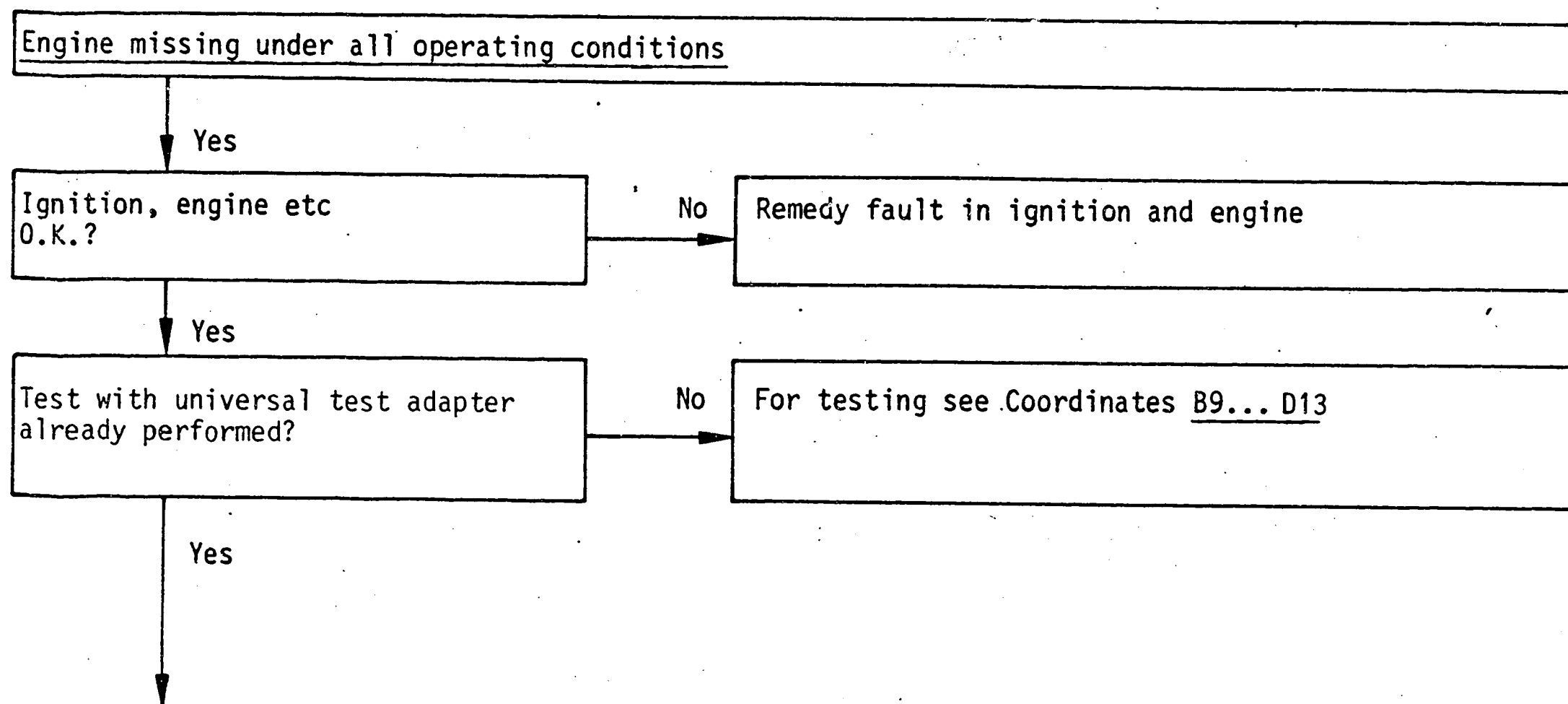
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.



Continued on H 5/H 6

H3

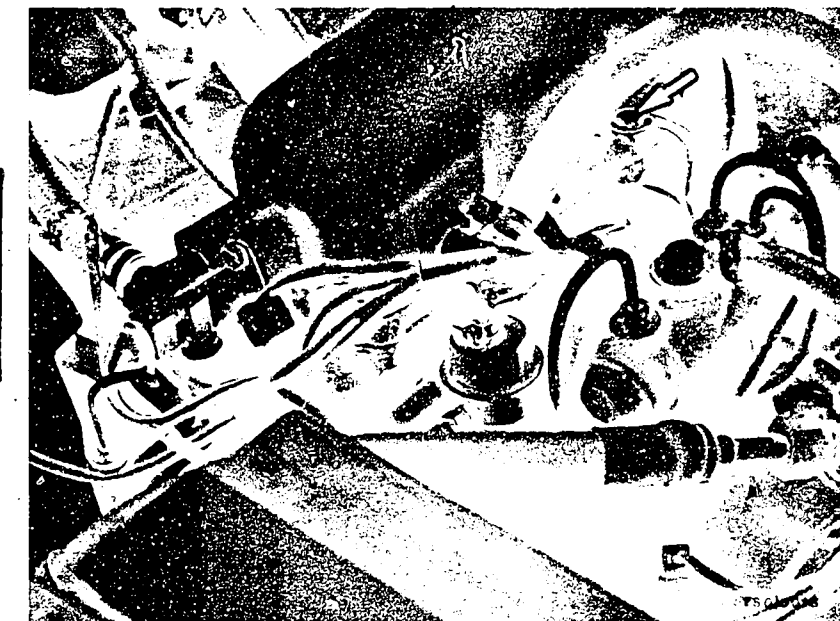
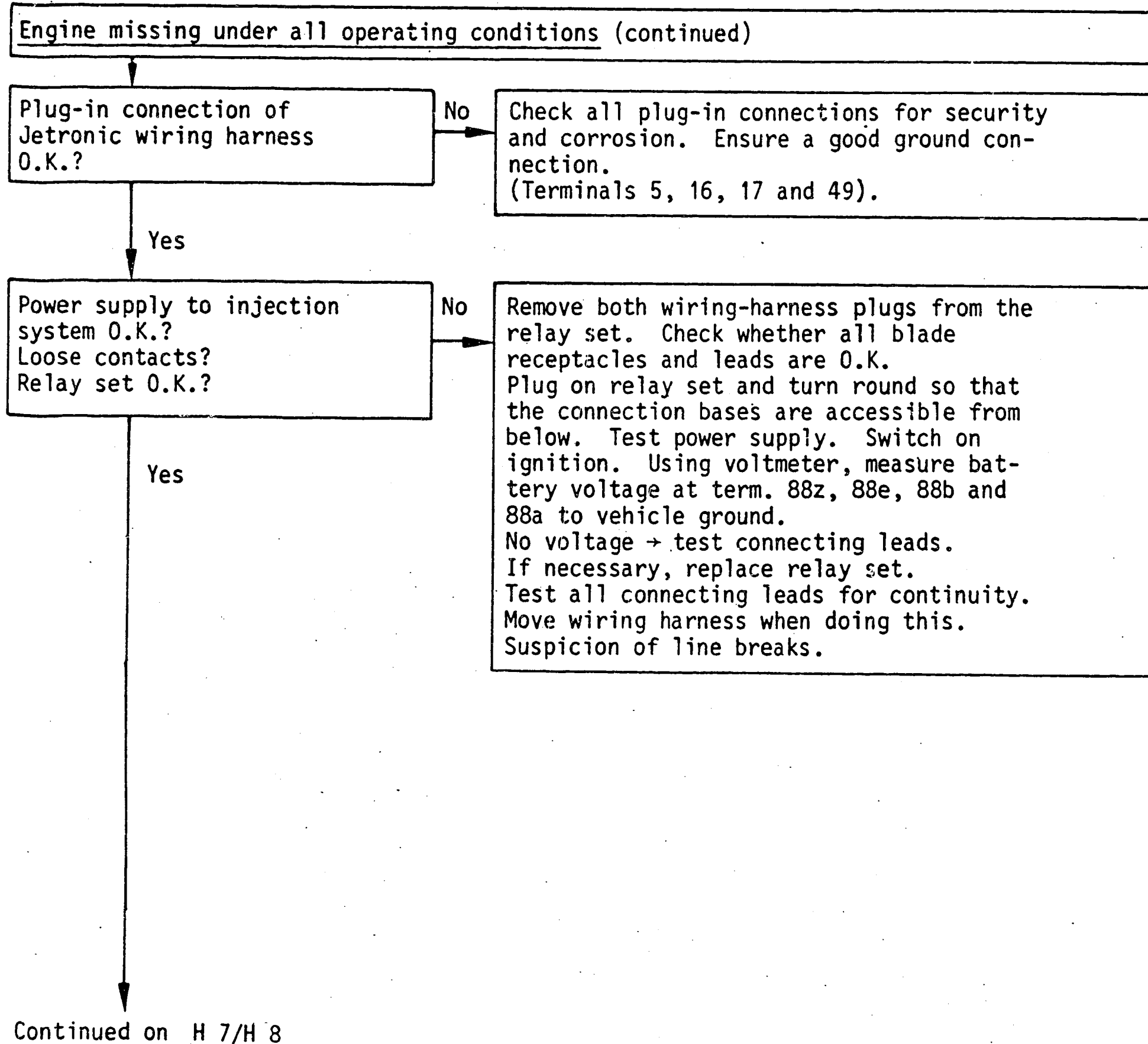
Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H4

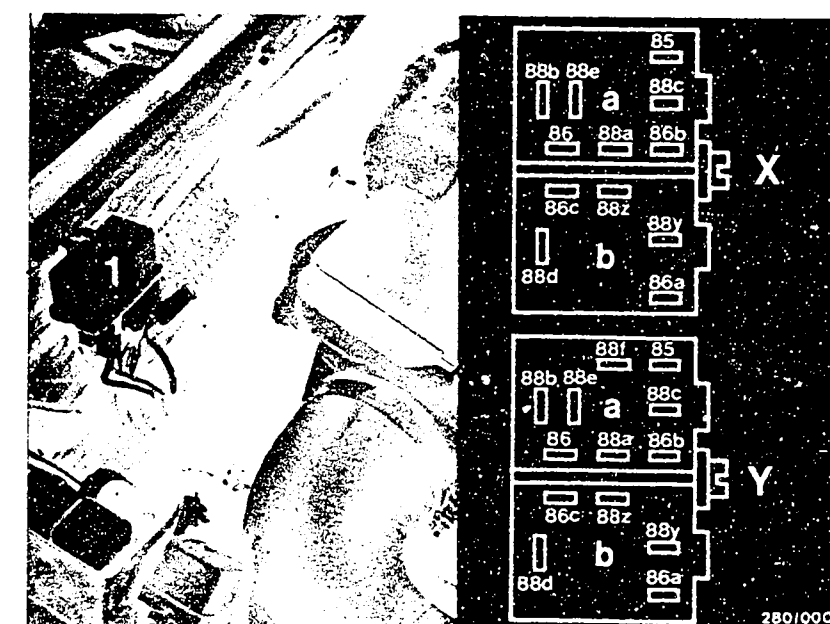
Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US





Arrow = Central ground terminal on intake manifold near pressure regulator

Connection base (viewed from below)
 1 = Relay set
 x = 0 332 514 105
 y = 0 332 514 121/127
 a = Jetronic wiring harness
 b = Vehicle wiring harness



H5

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H6

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



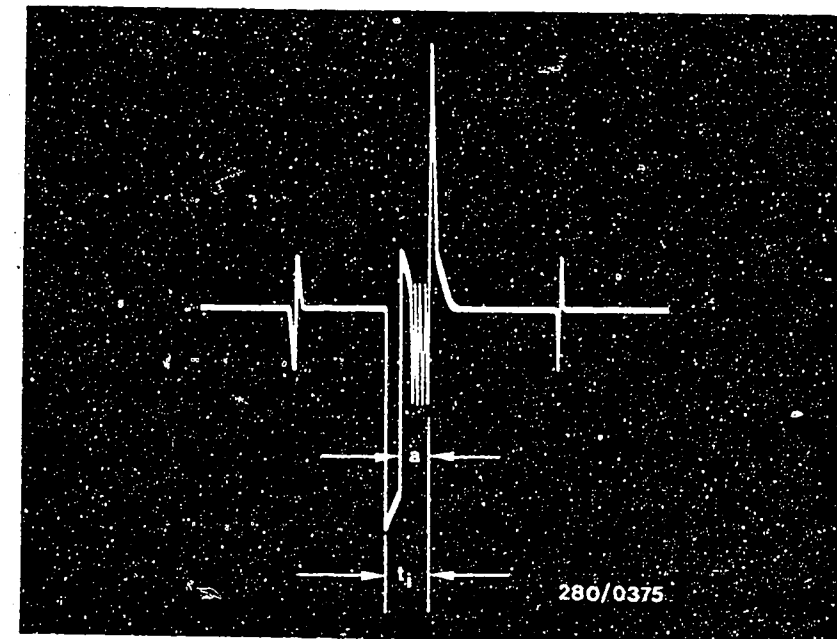
Engine missing under all operating conditions (continued)

Generator with regulator O.K.?
(Engine missing due to voltage peaks).

no

Connect the test lead as follows:
The two-pole plug connectors of the test lead are connected between a solenoid-operated injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.
When the correct terminal is connected, the picture opposite can be seen on the oscilloscope.
With the aid of the test lead it is possible with an ignition oscilloscope to test the injection pulses at the injection valves with the engine running.
If the picture opposite is not obtained or if there are deviations (interference, missing etc.), the other injection valves should also be tested.
With the engine stopped, remove the plug from the alternator. Start the engine. If missing stops, test the alternator and regulator. Voltage peaks are visible on the ignition oscilloscope.
In case of interference → check routing of the leads.
In case of missing → remedy loose contacts in leads or in plug-in connections.

yes



Injection pulse of a current-regulated output stage (measured at the injection valve)

a = Length of regulation (depends on engine load)

ti = Injection pulse

At idle without any load on the engine the current regulation a is not yet visible on the oscilloscope.

Continued on H9/H10

H7

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H8

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Air-flow sensor
O.K.?

No

Yes

Testing:

Open-air flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect sensor flap (remove hose between air filter and air-flow sensor).

Test specifications:

0 280 202 017
(with code number
5 or 8):

100...500 Ω

0 280 202 017 and
0 280 202 019...23
(with code number 21):

2000...1000 Ω

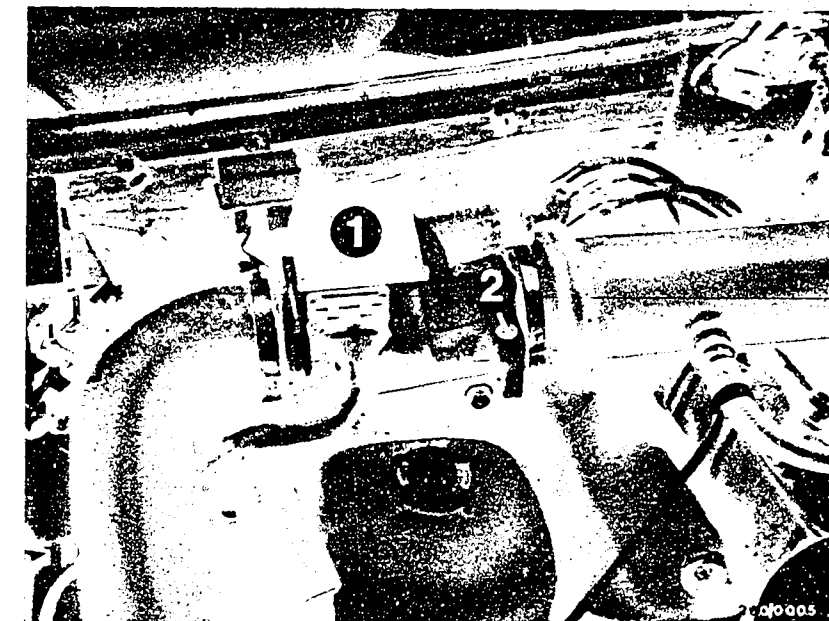
Checking the pump contact:

1. Remove plug from air-flow sensor. Using ohmmeter, measure resistance between term. 36 and term. 39.

Deflect air-flow sensor flap.

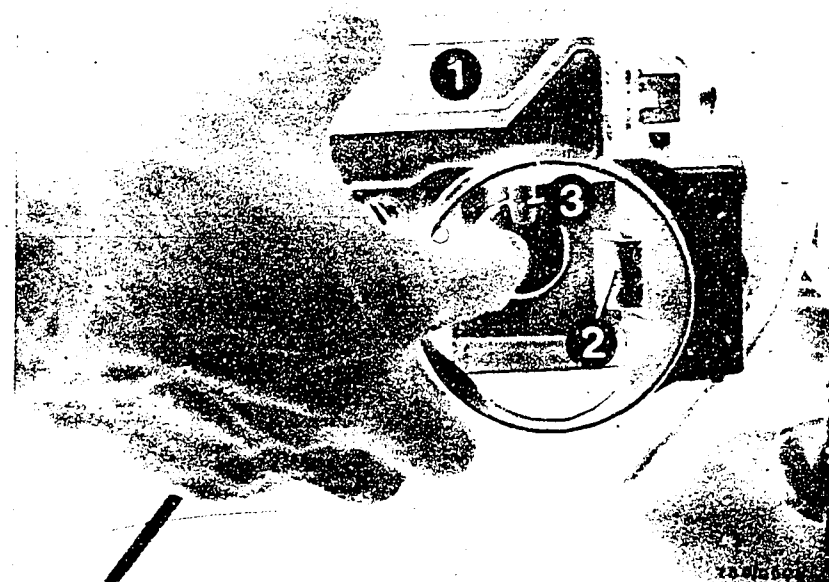
Set value approx. 0 Ω .

Continued on H11/H12



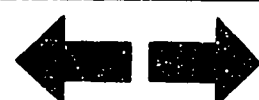
- 1 = Air-flow sensor
- 2 = Bypass screw
(CO adjustment)
Turning in clockwise
direction = richer mixture

Pushing open the air-flow
sensor flap



H9

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H10

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Air-flow sensor O.K.? (continued)

no

Testing:

Remove hose between air filter and air-flow sensor.
Air-flow sensor as of FD 051

Engine stopped while hot:

Remove air hoses and connector from air-flow sensor.
Connect ohmmeter to term. 36 and term. 39 of air-flow sensor.

1. Sensor flap in rest position

$\infty \Omega$

2. Deflect sensor flap

0Ω

Check the diode in the air-flow sensor. Connect ohmmeter to term. 6 and term. 36 on air-flow sensor:

Positive pole of ohmmeter to term. 6: approx. 0Ω

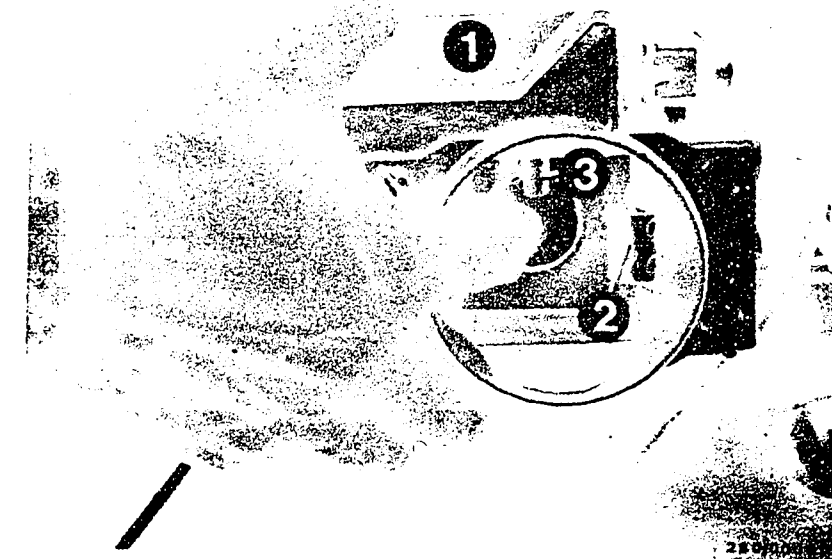
With reversed polarity:

approx. $\infty \Omega$

Visual examination of air duct in air-flow sensor.
Sensor flap and stopper must not be bent. If necessary, replace air-flow sensor.

yes

Continued on H13/H14



Pushing open the air-flow sensor flap

H11

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H12

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued).

Air-flow sensor O.K.?(continued)

no

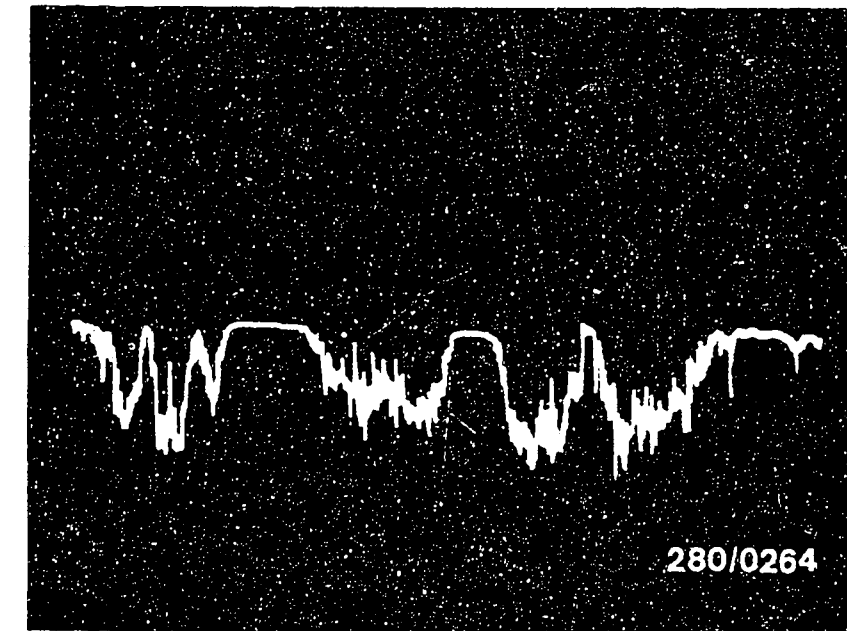
Testing the potentiometer (noise test):

Remove hose between air filter and air-flow sensor. Leave the connector on. Set motortester to special input and, using the special cable, connect to air-flow sensor term. 7 (red clip) and term. 6 (black clip). Set control stick for image adjustment on motortester as far as it will go to the left (calibrated setting). Ignition "ON", deflect air-flow sensor flap suddenly (several times). If incorrect (see illustration) → replace air-flow sensor.

Caution!

After testing is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure that the hose clamp is tight. Do not bend any contacts in the connector.

yes



Continued on H15/H16

H13

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H14

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Fuel delivery
O.K.?

Yes

No

Measuring the fuel delivery:

For testing, undo the junction between the fuel return hose (from pressure regulator) and fuel return line (to fuel tank). If necessary, extend hose and lead into a 5 l vessel with graduated scale. Remove air hose to air filter on air-flow sensor. Open air-flow sensor flap by hand until pump operates.

Test specification: min. 675 cm³/30 s

Remedy if test specification not reached:

- Fuel filter clogged → replace
- Voltage at fuel pump plugs, with engine running min. 12 V → clean contacts; possibly also eliminate poor ground connection; replace leads.
- Fuel pressure regulator defective → replace
- Fuel pump delivery too low → replace fuel pump.

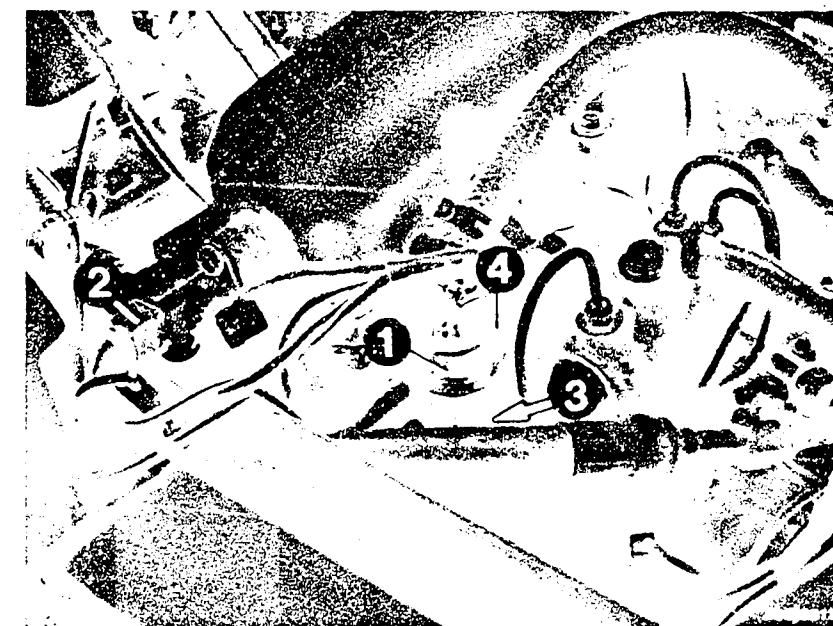
Control unit
O.K.?

Yes

No

Let engine run. Shake control unit lightly and move multiple plug. Watch for engine missing. Repair plug-in connection on multiple plug or replace defective control unit.

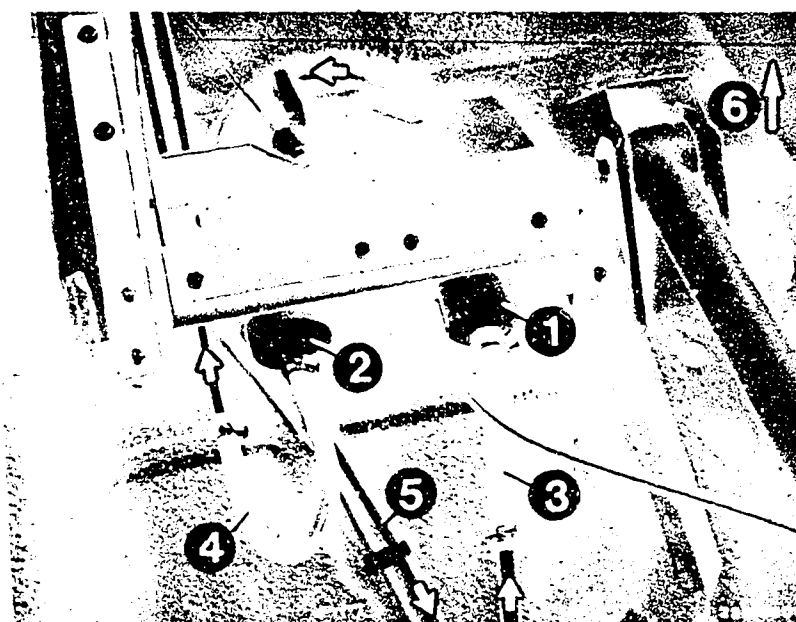
Continued on H17/H18



1 = Pressure regulator
3 = Fuel return line

1 = Electric fuel pump
2 = Fuel filter
3 = Fuel inlet line
4 = Fuel delivery line
5 = Fuel return line
6 = Forwards travel

Arrow: Direction of fuel return



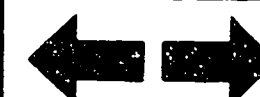
H15

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H16

Engine missing under all op. conditons
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Burbling on the overrun?
Throttle valve closed?
CO and idle adjustment O.K.?
Injection pulses O.K.?

no

1. Check the exhaust system for leaks.
2. Throttle valve closed?
Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.
Adjustment:
Throttle valve must be set just before it sticks with the throttle-valve stop screw. Straighten throttle linkage if bent.

3.1 Testing the overrun cutoff with motortester:

Connect the test lead as follows:

The two-pole plug connectors of the test lead are connected between a solenoid-operated injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.

When the correct terminal is connected, the picture opposite can be seen on the oscilloscope.

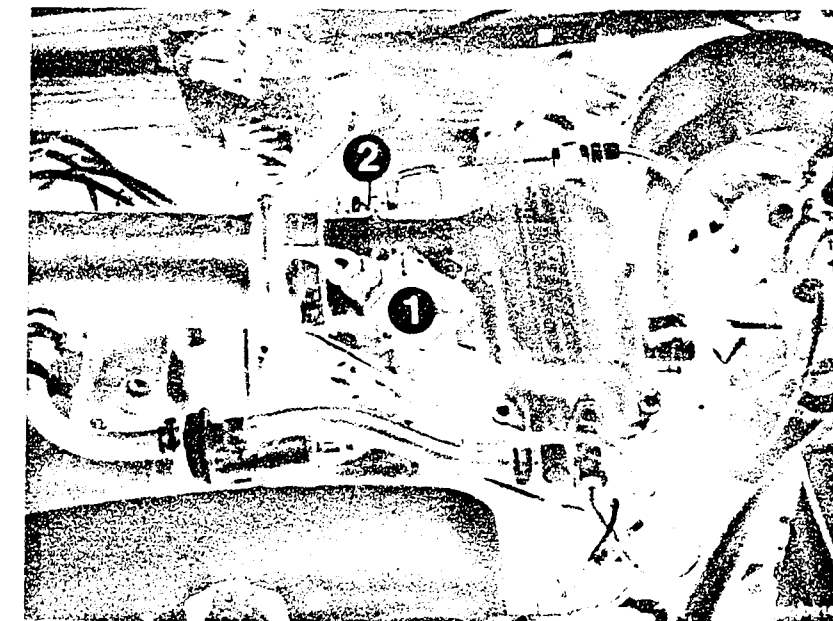
With the aid of the test lead it is possible with an ignition oscilloscope to test the injection pulses at the injection valves with the engine running.

Testing: Let the warmed-up engine run. Observe the motortester (injection signal present). Bring engine to approx. 4000 min⁻¹ (injection signal present). Suddenly close the throttle valve (foot off accelerator) → injection signal no longer present.

yes

yes

Continued on H19/H20



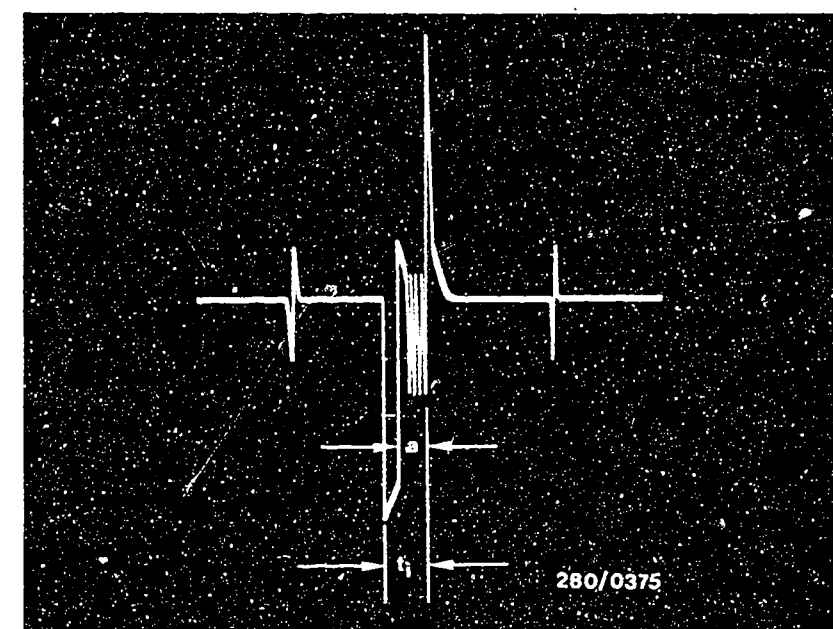
2 = Throttle-valve stop screw

Injection pulse of a current-regulated output stage (measured at the injection valve)

a = Length of regulation (depends on engine load)

ti = Injection pulse

At idle without any load on the engine "a" is not yet visible on the oscilloscope.



H17

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H18

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Burbling on the overrun? Throttle valve closed? CO and idle adjustment O.K.? (Continued)

no

Fiat 132/Argenta

(Control unit 0 280 000 204):

Up to approx. 1700 min⁻¹ there must be no injection pulses. Below 1300 min⁻¹ the injection pulses must be present again.

Fiat Spider 2000 US

(Control unit 0 280 000 194...207):

Up to approx. 2000 min⁻¹ there must be no injection pulses. Below 1300 min⁻¹ the injection pulses must be present again.

If not: check connecting leads from multiple plug to throttle-valve switch. If O.K., replace control unit.

3.2 Testing the overrun cutoff in general:

Bring the engine to 4000 min⁻¹ and, using insulated wire, bridge term. 2 and term. 18 in the plug of the throttle-valve switch.

Fiat 132/Argenta

(Control unit 0 280 000 204):

Engine at normal operating temperature:

Up to approx. 1700 min⁻¹ there must be no injection pulses. Below 1300 min⁻¹ the injection pulses must be present again.

Fiat Spider 2000 US

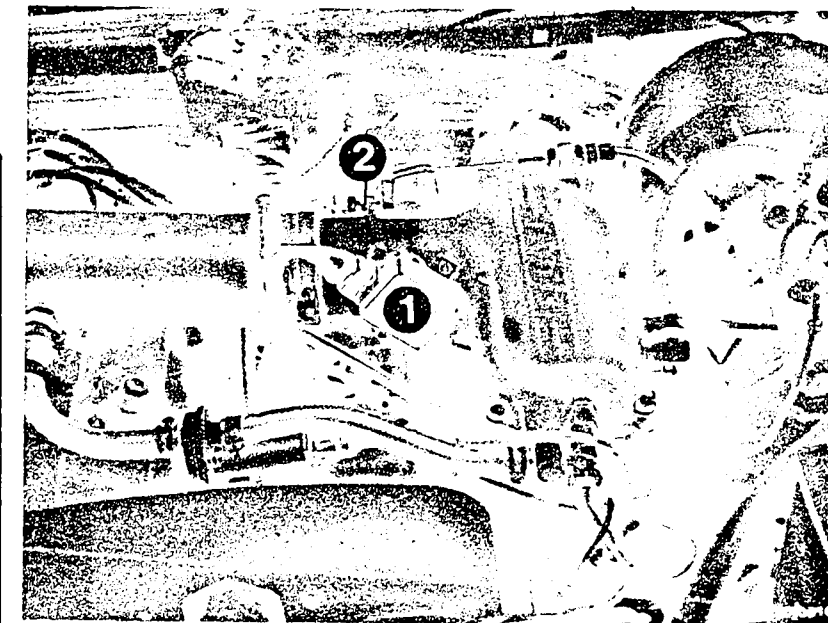
(Control unit 0 280 000 194...207):

Engine at normal operating temperature:

Up to approx. 2000 min⁻¹ there must be no injection pulses. Below 1300 min⁻¹ the injection pulses must be present again.

yes

Continued on H21/H22



1 = Throttle-valve switch
2 = Throttle-valve stop screw

yes

H19

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H20

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Burbling on the overrun?
Throttle valve closed?
CO and idle adjustment
O.K.?
(continued)

No

CO and idle adjustment

Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted transmission:

$800 \dots 900 \text{ min}^{-1}$

Automatic transmission
(selector lever in position "D" and hand-brake on):

$700 \dots 800 \text{ min}^{-1}$

CO adjustment for Fiat Spider 2000 US

(Lambda sensor disconnected)

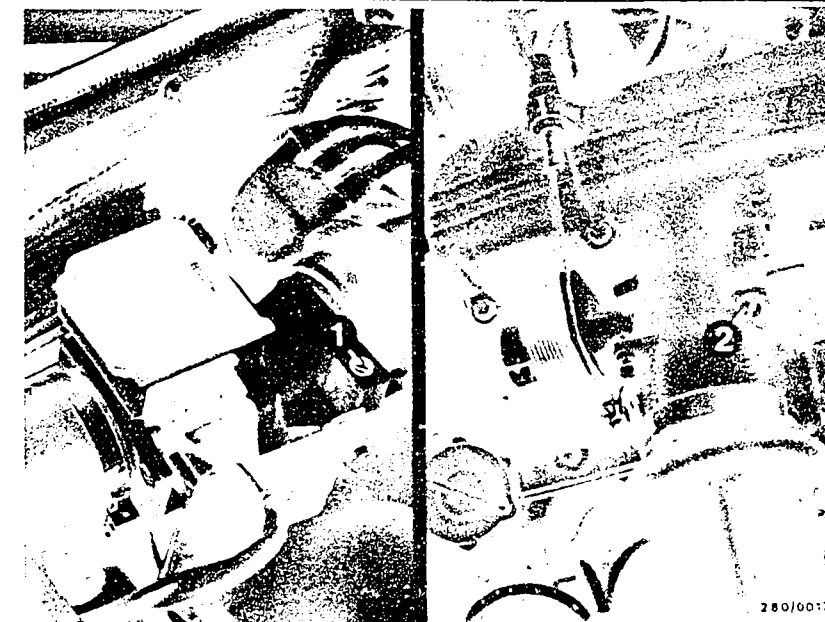
Max. 0.8 % by vol. CO

Let warmed-up engine idle with air conditioner (if fitted) switched off. Connect connecting leads on solenoid-operated air valve to battery voltage. Engine speed is increased by approx 150 min^{-1} . If there is no change in engine speed, replace the solenoid-operated air valve.

If CO concentration too high, turn bypass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction. Check engine speed and CO concentration again. Carry out adjustments in several steps. After adjusting, use new plugs.

Yes

Continued on H23/H24

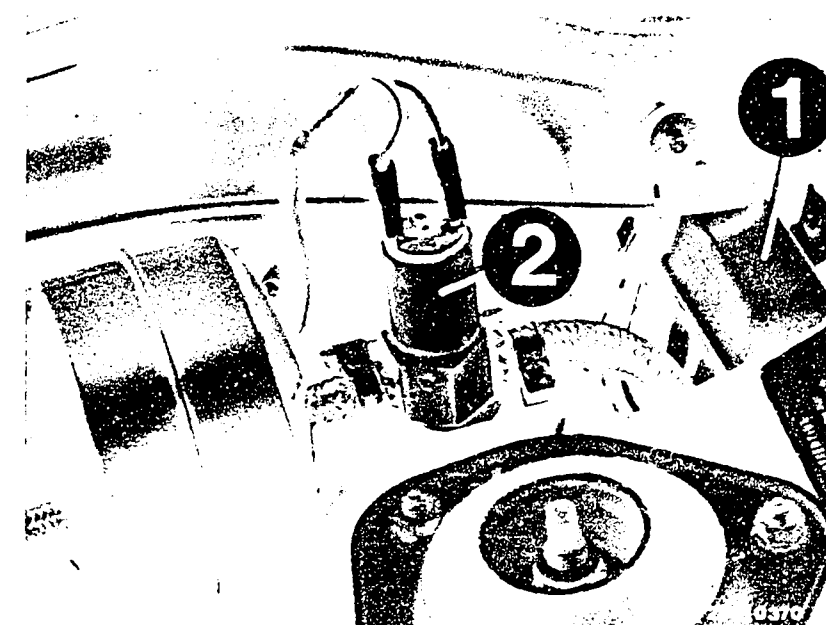


1 = CO adjusting screw

2 = Idle-speed-adjusting screw

1 = Relay set

2 = Solenoid-operated air valve



H21

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H22

Engine missing under all op. conditons
Fiat 132/Argenta/Spider 2000 US



Engine missing under all operating conditions (continued)

Testing completed for
customer complaint

"Engine missing"

Further test information:
For testing the solenoid-
operated injection valves
see Coordinate H 9 on-
wards.

No

Further possibilities:

- Customer complaint incorrectly
diagnosed (see Coordinates B3...B8).
If the fault has not been detected
by "direct trouble-shooting", see
"detailed trouble-shooting" (Coordinates
B3/B4).
- Engine not mechanically O.K. (Compres-
sion, valve setting, valve timing, worn
camshaft).

H23

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



H24

Engine missing under all op. conditions
Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

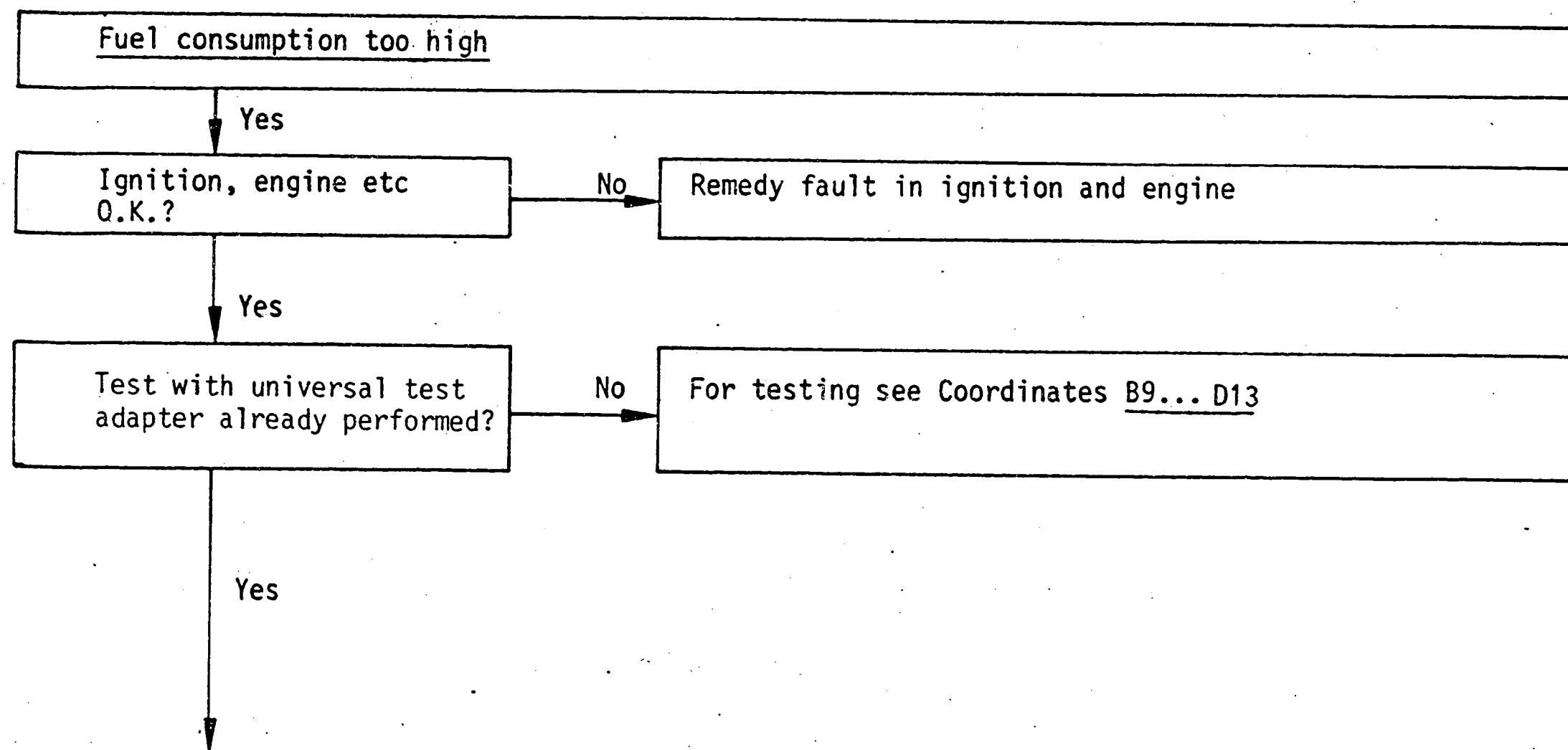
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.



Continued on J 3/J 4

J1

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



J2

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



Fuel consumption too high (continued)

Have all brakes released fully?

Yes

Start valve O.K.?

No

Testing the start valve for leaks:

1. When installed

Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.

2. When removed

Remove start valve (Caution! Fire Hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (remove hose between air filter and air-flow sensor. Ignition "ON" and deflect air-flow sensor flap).

Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Caution!

After the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight (leaks).

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta

2.8...3.2 bar

2. Fiat Spider 2000 US

2.3...2.7 bar

Test specification reached?

No

Testing: Remove hose from start valve.

Connect pressure gauge.

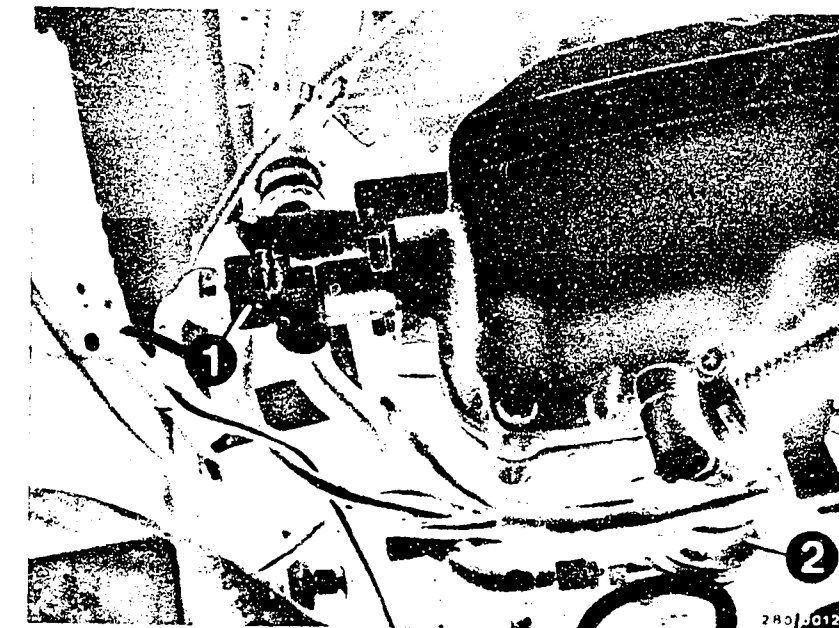
Caution:

When removing the fuel hose make sure that no fuel gets onto hot parts of the engine.

Yes

Yes

Continued on J 5/J 6

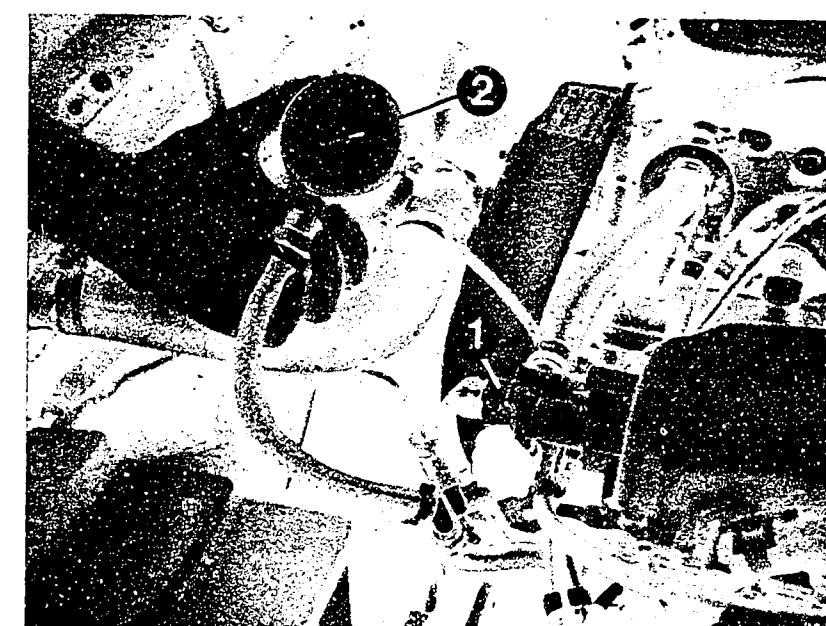


1 = Start valve

2 = Pressure regulator

1 = Start valve

2 = Pressure gauge



J3

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



J4

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



Fuel consumption too high (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

No

Testing the fuel pressure

Connect the connections of the pressure testers into the fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw.

Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the fuel-distribution pipe.

Make sure there are no leaks.

Switch on ignition. Remove hose between air filter and air-flow sensor. Deflect air-flow sensor flap slightly (pump contact must close). Fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta
2.8...3.2 bar

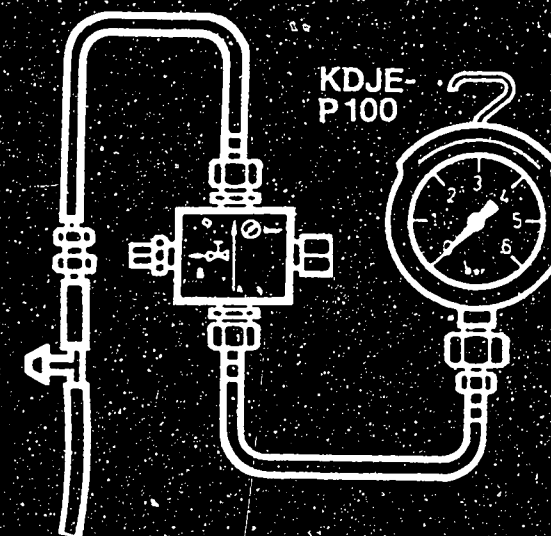
Fiat Spider 2000 US
2.3...2.7 bar

Let engine idle → pump pressure approx. 2.5 bar (132/Argenta) and 2.0 bar (Spider 2000 US).

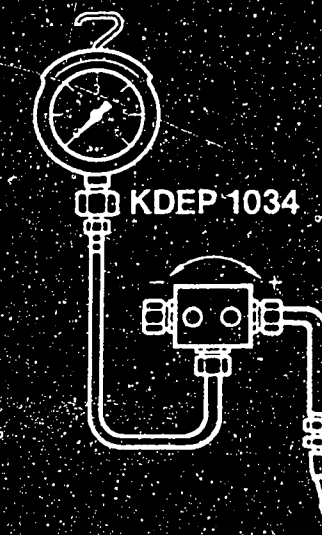
Yes

Yes

Continued on J 7/J 8



280/0331



280/0332



1687 231 154

280/0333

J5

Fuel consumption too high

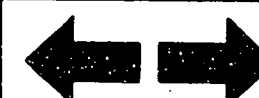
Fiat 132/Argenta/Spider 2000 US



J6

Fuel consumption high

Fiat 132/Argenta/Spider 2000 US



Fuel consumption too high (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Pressure regulator O.K.?
Test specification reached?

No

Testing the pressure regulator

Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close).
Electric fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta

2.8...3.2 bar

Fiat Spider 2000 US

2.3...2.7 bar

Fuel pressure of 2.8 bar (132/Argenta) or
2.3 bar (Spider 2000 US) not reached:

1. Slowly pinch off fuel return line:
(Caution: Do not load pressure gauge
above 6 bar).

Pressure rises above 4 bar → replace
pressure regulator.

Pressure remains below 4 bar → replace
fuel pump.

2. Check fuel delivery line and fuel filter
for throughflow.

3. Strainer in tank clogged.

4. Corrosion in tank.

Fuel pressure of 3.2 bar (132/Argenta) or
2.7 bar (Spider 2000 US) exceeded:

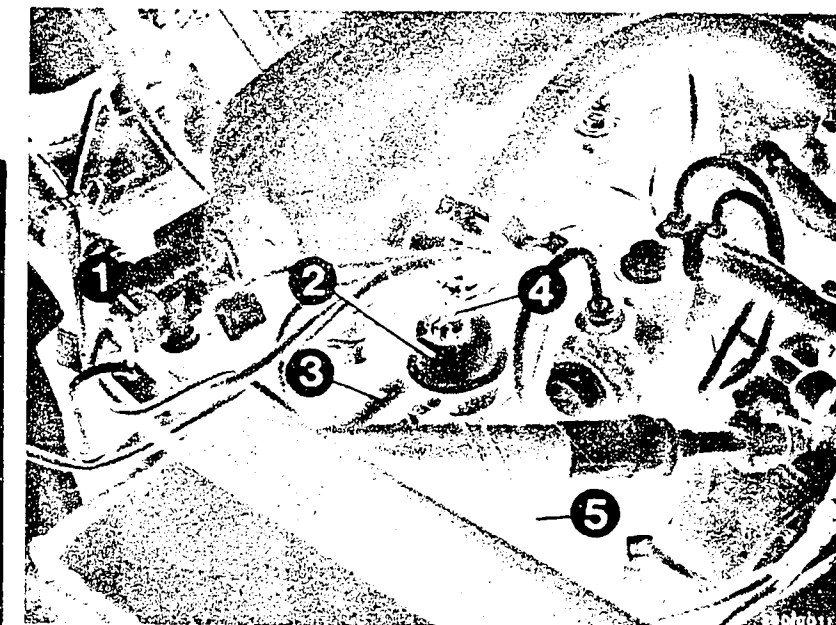
1. Fuel return line clogged or pinched.

2. Replace pressure regulator.

Fit hose between air filter and air-flow
sensor and tighten hose clamp (leaks).

Yes

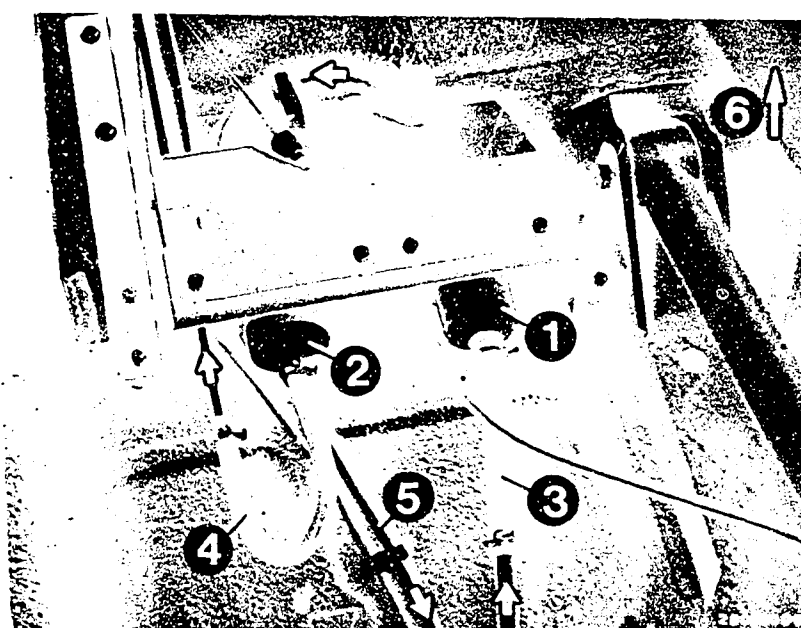
Continued on J 9/J10



2 = Pressure regulator
5 = Fuel return line

1 = Electric fuel pump
2 = Fuel filter
3 = Fuel inlet line
4 = Fuel delivery line
5 = Fuel return line
6 = Forwards travel

Arrow: Direction of fuel return



J7

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



J8

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



Fuel consumption too high (continued)

Temperature sensors tested?

No

Testing:

Temperature sensor I measures the intake air temperature and is located in the air duct of the air-flow sensor. Measure the following values between term. 27 and term. 6 of air-flow sensor:

At ambient temperature
(approx. 15...30°C): 1.45...3.3 kΩ

With engine at normal operating temperature
(approx. 80°C): 280...360 Ω

Make direct resistance measure at temperature sensor II (engine) using ohmmeter. Resistance measurement at term. 13 and term. 49 (ground):

At ambient temperature
(approx. 15...30°C): 1.3...3.6 kΩ

With engine at normal operating temperature
(approx. 80°C): 250...390 Ω

If incorrect, check for open circuit or short circuit in following leads using ohmmeter:

Temperature sensor I:

Multiple plug term. 27 to air-flow sensor term. 27 and air-flow sensor term. 6 to multiple plug term. 6.

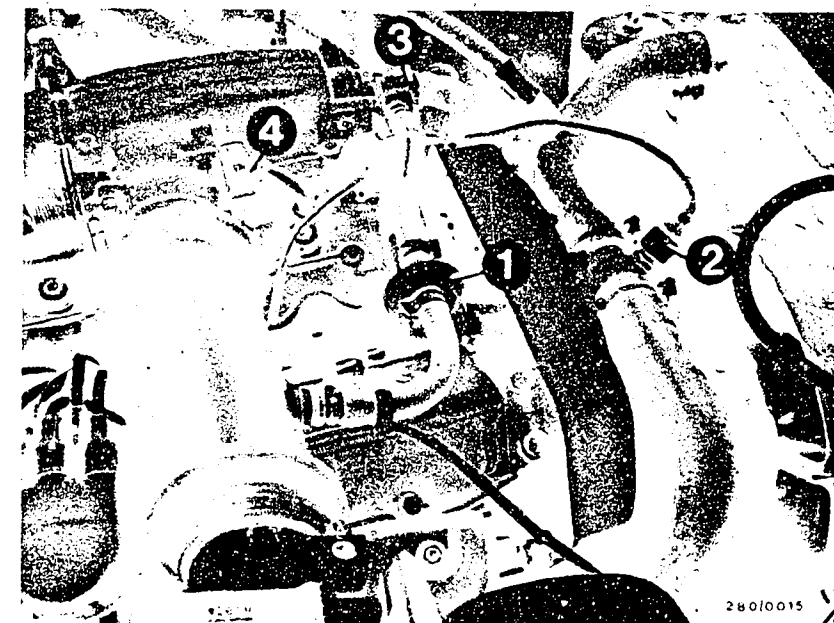
Temperature sensor II:

Multiple plug term. 13 to temperature sensor II term. 13 and temperature sensor II term. 49 to central ground (lead 49).

Check all contacts in the plug-in connections.

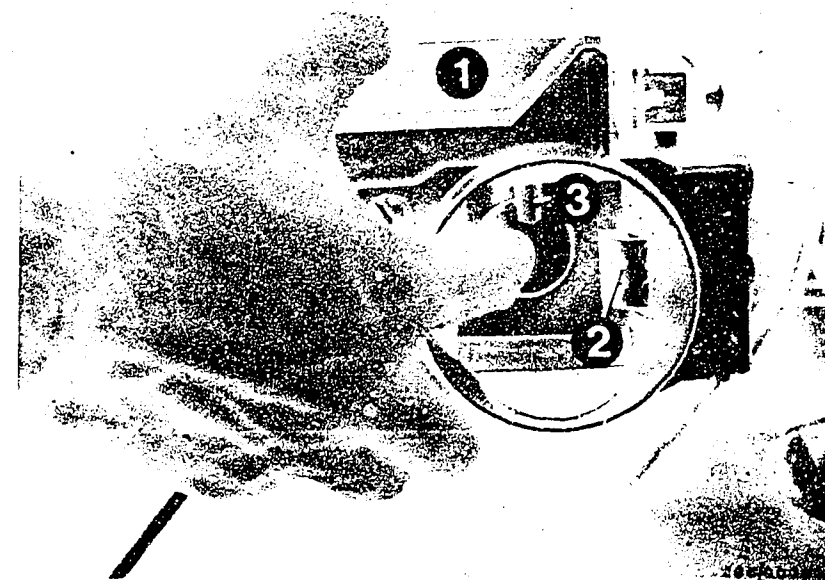
Yes

Continued on J11/J12



- 1 = Auxiliary-air device
- 2 = Temperature sensor II (engine)

Pushing open the air-flow sensor flap



J9

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



J10

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



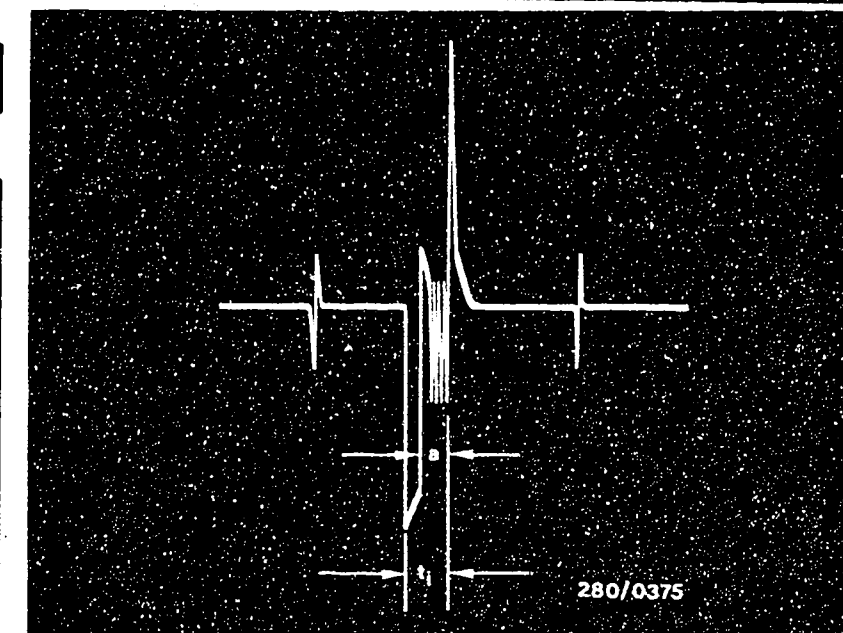
Fuel consumption too high (continued)

Solenoid-operated injection valves checked for proper operation? (Electrically)

no

Connect the test lead as follows:
The two-pole plug connectors of the test lead are connected between a solenoid-operated injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.
When the correct terminal is connected, the picture opposite can be seen on the oscilloscope.
With the aid of the test lead it is possible with an ignition oscilloscope to test the injection pulses at the injection valves with the engine running. If the picture opposite is not obtained or if there are deviations (interference, missing etc.), the other injection valves should also be tested.
In case of interference → check routing of the leads.
In case of missing → remedy loose contacts in leads or in plug-in connections.
Observe injection pulse at idle.
Remove throttle-valve switch connector and bridge term. 3 and term. 18 (insulated wire).
Caution! Do not bend any contacts in the connector.
Injection pulse must become longer. If not: check connecting leads from multiple plug to throttle-valve switch (term. 3 and term. 18) for continuity. If O.K., replace control unit.

yes



Injection pulse of a current-regulated output stage (measured at the injection valve)
a = Length of regulation (depends on engine load)
ti = Injection pulse

At idle without any load on the engine the current regulation a is not yet visible on the oscilloscope.

Continued on J13/J14

J11

Fuel consumption too high
Fiat 132/Argenta/Spider 2000 US



J12

Fuel consumption too high
Fiat 132/Argenta/Spider 2000 US



Fuel consumption too high (continued)

Injection valves
mechanically O.K.?

No

With the engine running, detach injection-valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve O.K. Test for continuity in connecting leads from relay set term. 88b, term. 88e via the injection valves to control unit term. 14, 15, 32 and 33. If necessary, replace leads or injection valves.

Yes

Air-flow sensor
O.K.?

No

Testing:
Open-air flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohm-meter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect sensor flap (remove hose between air filter and air-flow sensor).

Test specifications:

0 280 202 017

(with code number

5 or 8):

100...500 Ω

0 280 202 017 and

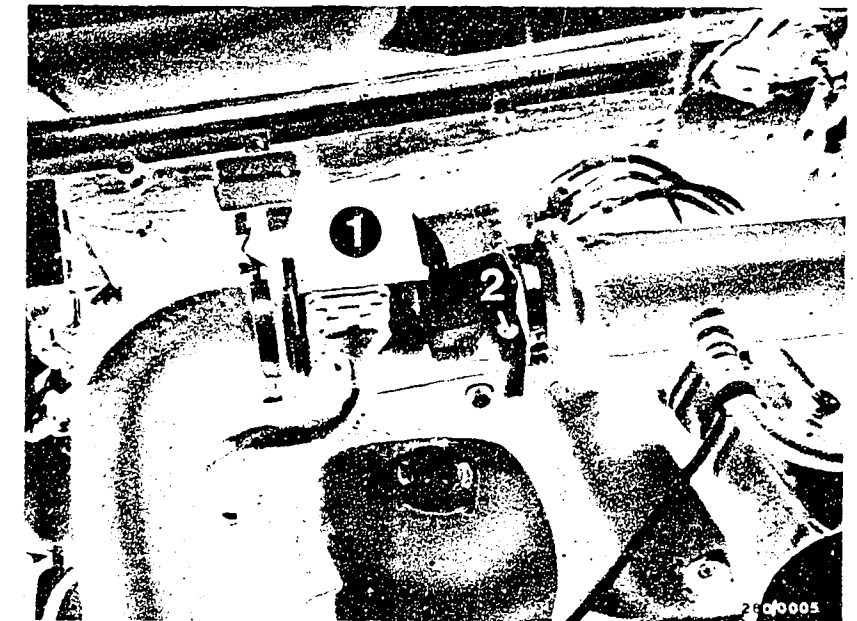
0 280 202 019...23

(with code number 21):

200...1000 Ω

Yes

Continued on J15/J16

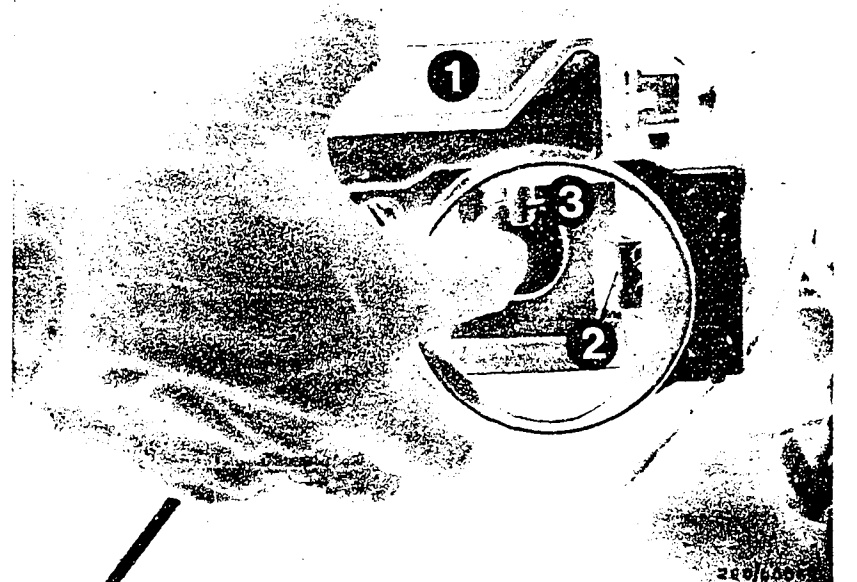


1 = Air-flow sensor

2 = Bypass screw

(Turning in a clockwise direction = richer mixture)

Pushing open the air-flow sensor flap



J13

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US

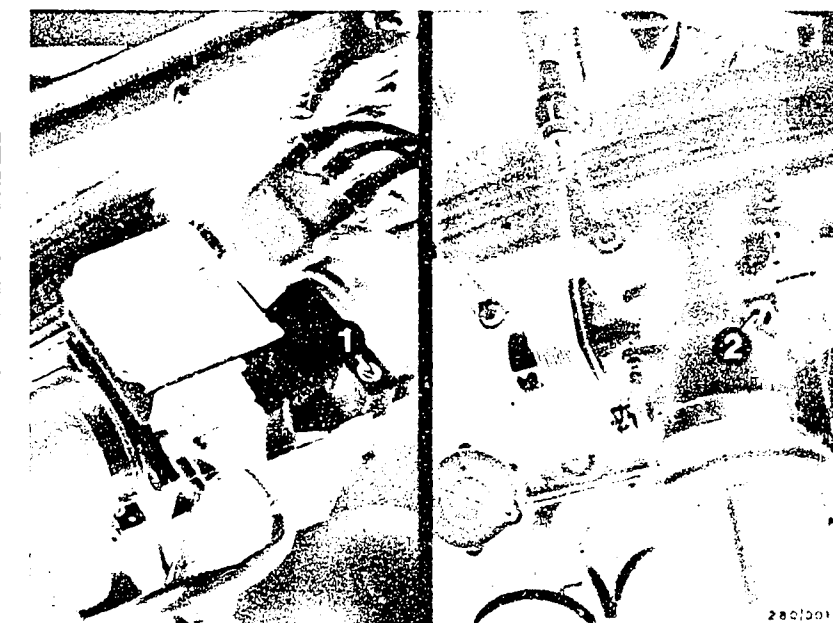
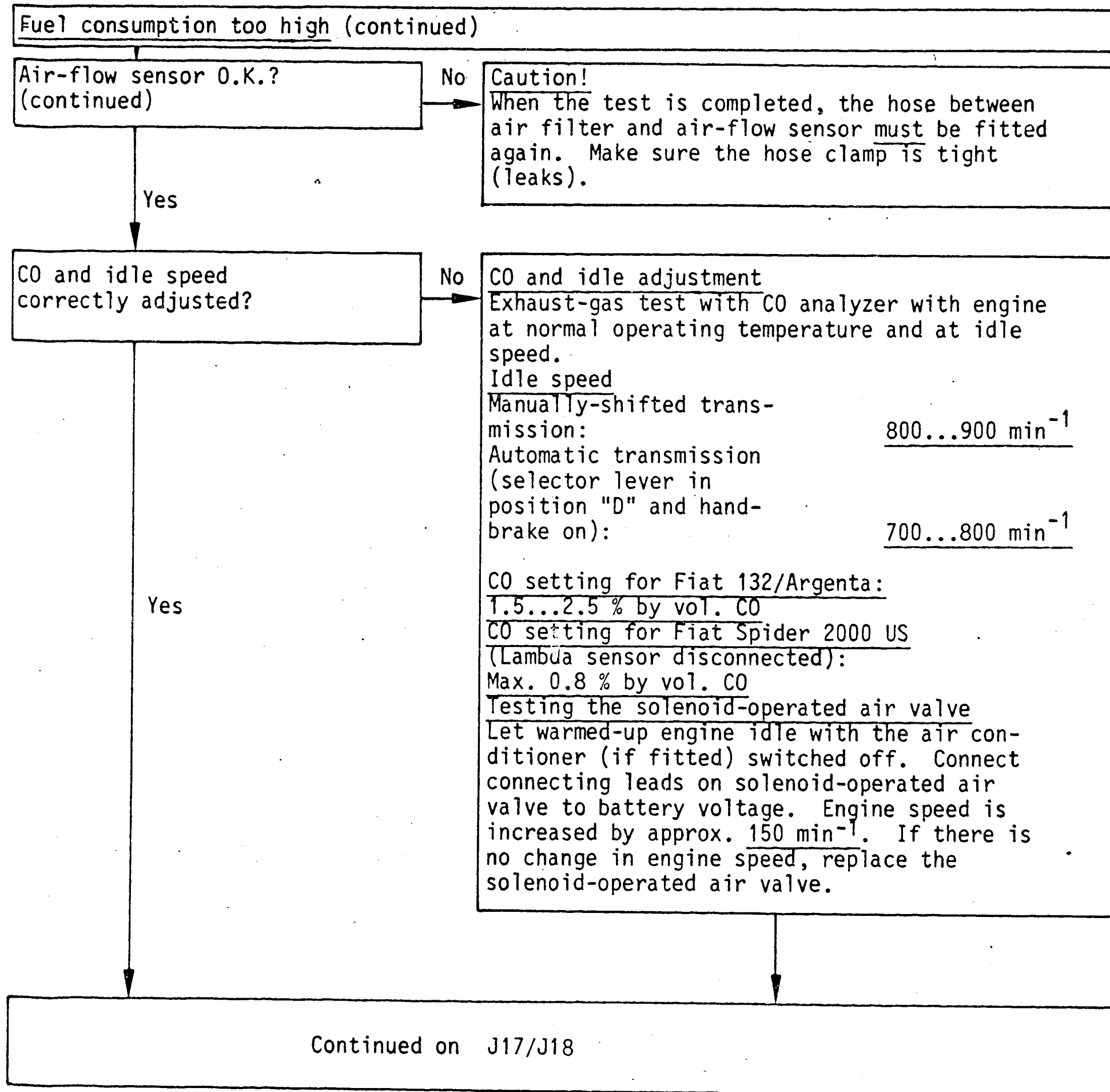


J14

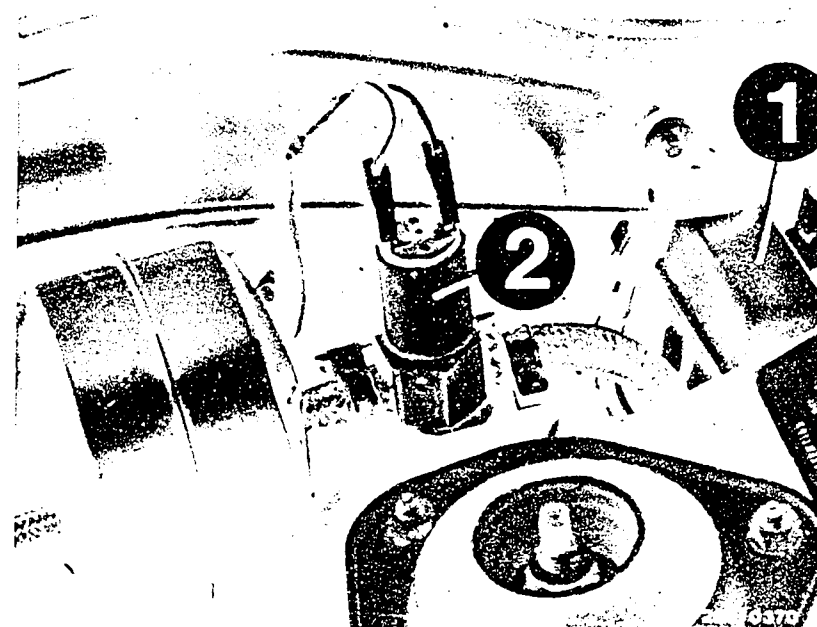
Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US





1 = CO adjusting screw
2 = Idle-speed-adjusting screw



1 = Relay set
2 = Solenoid-operated air valve

Fuel consumption too high (continued)

CO and idle speed
correctly adjusted?

No

If CO concentration too high, turn bypass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction. Check engine speed and CO concentration again. Carry out adjustments in several steps. After adjusting, use new plugs.

Yes

Can idle speed not be
adjusted?

Yes

Testing completed
for customer
complaint

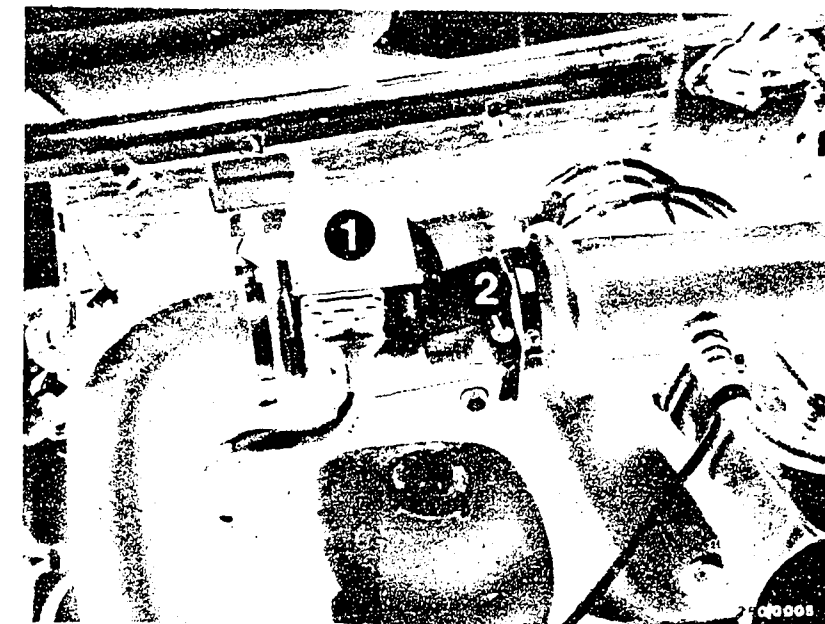
"Fuel consumption
too high"

Customer complaint
remedied?

No

Further possibilities:

- Customer complaint incorrectly diagnosed. If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (Compression, valve setting, valve timing, worn camshaft).



1 = Air-flow sensor

2 = Bypass screw

(CO adjustment)

Turning in a clockwise
direction = richer mixture

J17

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



J18

Fuel consumption too high

Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

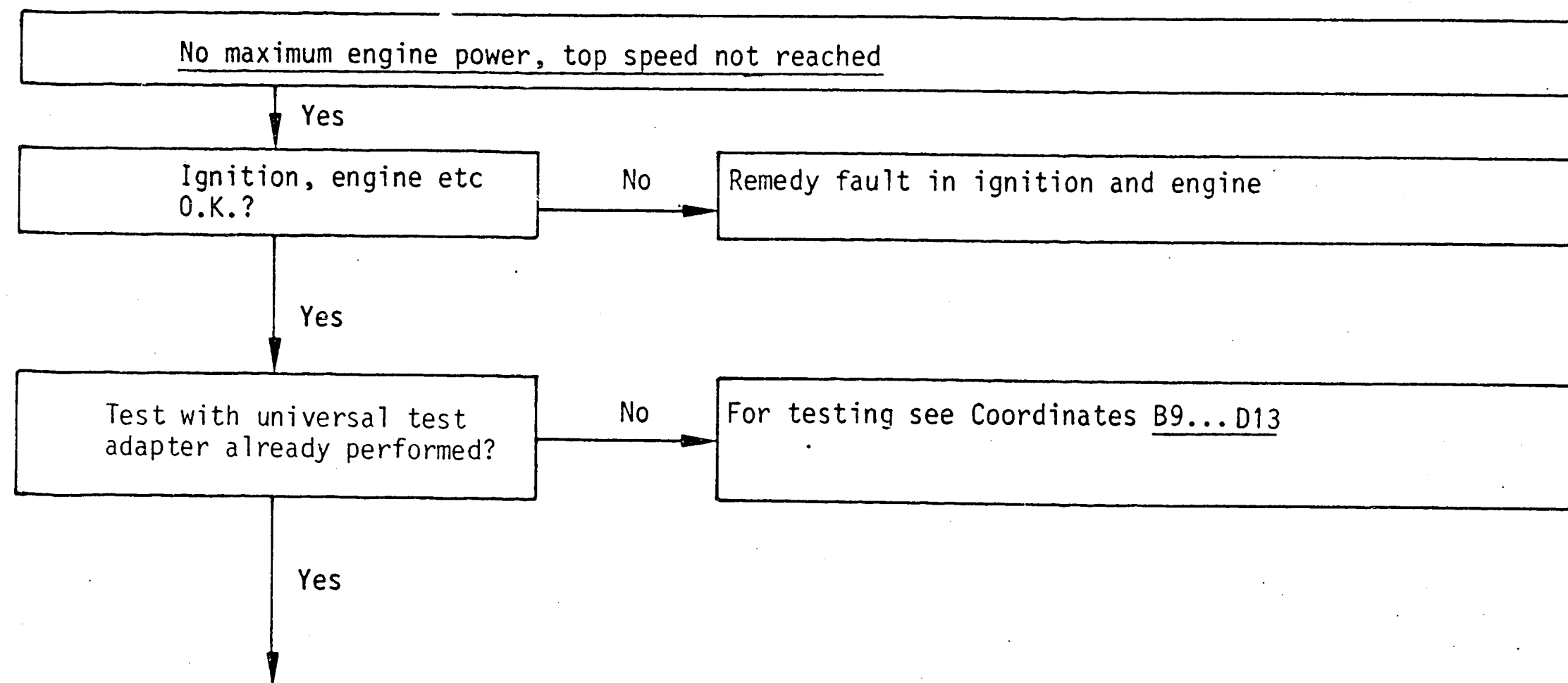
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.



Continued on : J21/J22

J19

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



J20

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



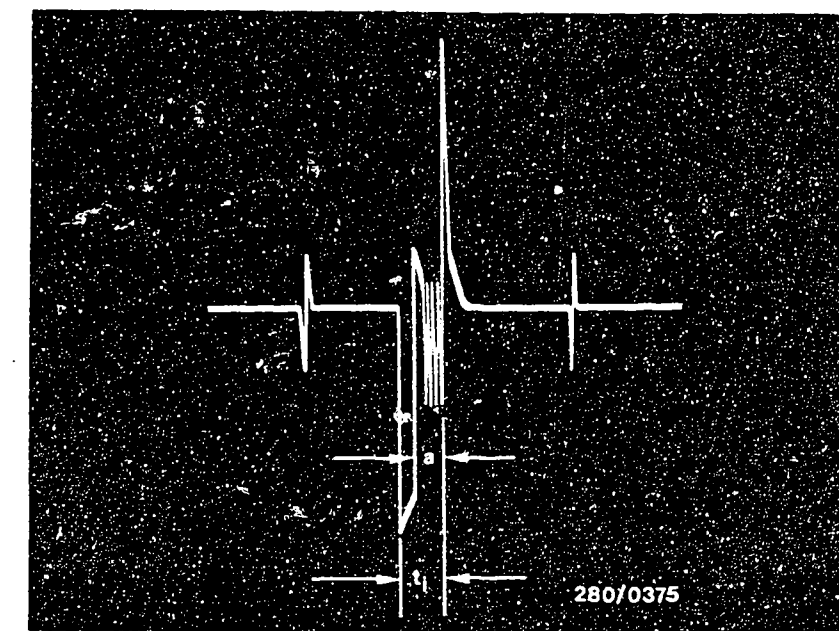
No maximum engine power, top speed not reached (continued)

Full-load enrichment O.K.?

no

Connect the test lead as follows:
The two-pole plug connectors of the test lead are connected between a solenoid-operated injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.
When the correct terminal is connected, the picture opposite can be seen on the oscilloscope.
With the aid of the test lead it is possible with an ignition oscilloscope to test the injection pulses at the injection valves with the engine running. If the picture opposite is not obtained or if there are deviations (interference, missing etc.), the other injection valves should also be tested.
In case of interference → check routing of the leads.
In case of missing → remedy loose contacts in leads or in plug-in connections.
Observe injection pulse at idle.
Remove throttle-valve switch connector and bridge term. 3 and term. 18 (insulated wire).
Caution! Do not bend any contacts in the connector.
Injection pulse must become longer. If not: check connecting leads from multiple plug to throttle-valve switch (term. 3 and term. 18) for continuity. If O.K., replace control unit.

yes



Injection pulse of a current-regulated output stage (measured at the injection valve)

a = Length of regulation (depends on engine load)

ti = Injection pulse

At idle without any load on the engine the current regulation a is not yet visible on the oscilloscope.

Continued on J23/J24

J21

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



J22

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



No maximum engine power, top speed not reached (continued)

Does throttle valve open fully?

Yes

No

Throttle linkage, accelerator pedal O.K.?
Straighten linkage if necessary. Throttle linkage may stick due to floor mat etc.
Check plug-in connections. Direct resistance measurement at throttle-valve switch between term. 18 and term. 3 (open throttle valve fully).
If necessary, replace throttle-valve switch.
Check for open circuit in lead from multiple plug term. 3 to throttle-valve switch term. 3.

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

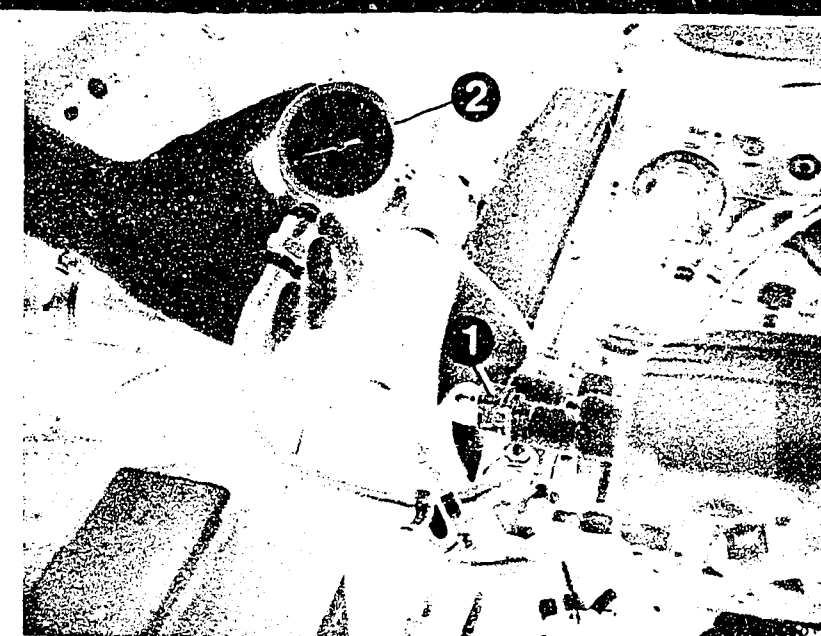
Test specification reached?
(Establish rated power at rated speed on chassis dynamometer and check the fuel pressure).
O.K.?

No

Testing: Remove hose from start valve.
Connect pressure gauge.
Caution: When removing the fuel hose make sure that no fuel gets onto hot parts of the engine.

Yes

Continued on K1/K2



1 = Start valve
2 = Pressure gauge

J23

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



J24

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



No maximum engine power, top speed not reached (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

No

Testing the fuel pressure

Connect the connections of the pressure testers into the fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw.

Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the fuel-distribution pipe.

Make sure there are no leaks.

Switch on ignition. Remove hose between air filter and air-flow sensor. Deflect air-flow sensor flap slightly (pump contact must close). Fuel pump must operate.

Fuel pump pressure

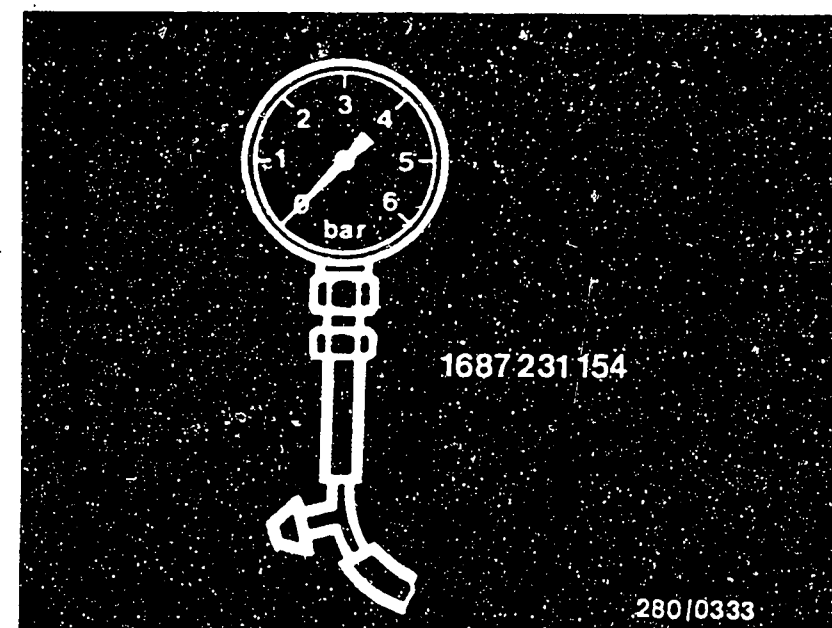
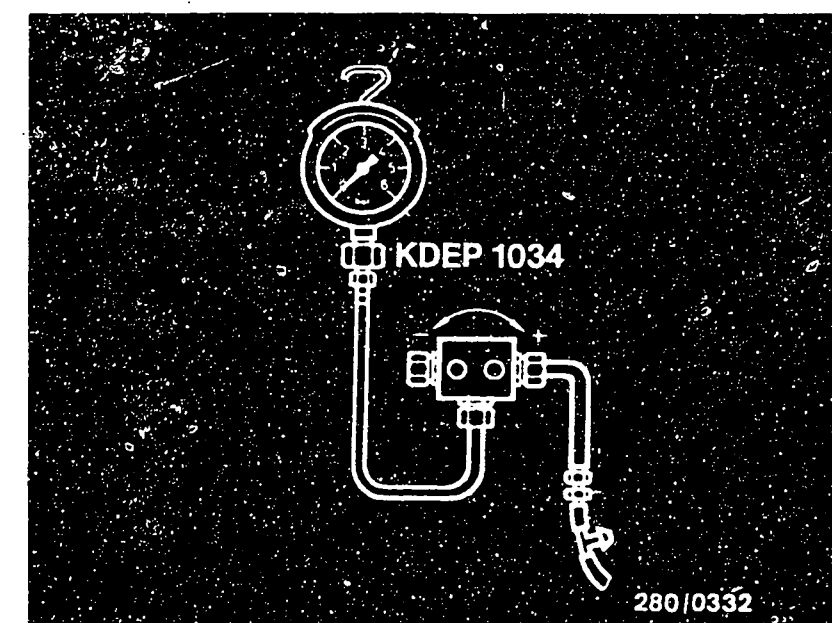
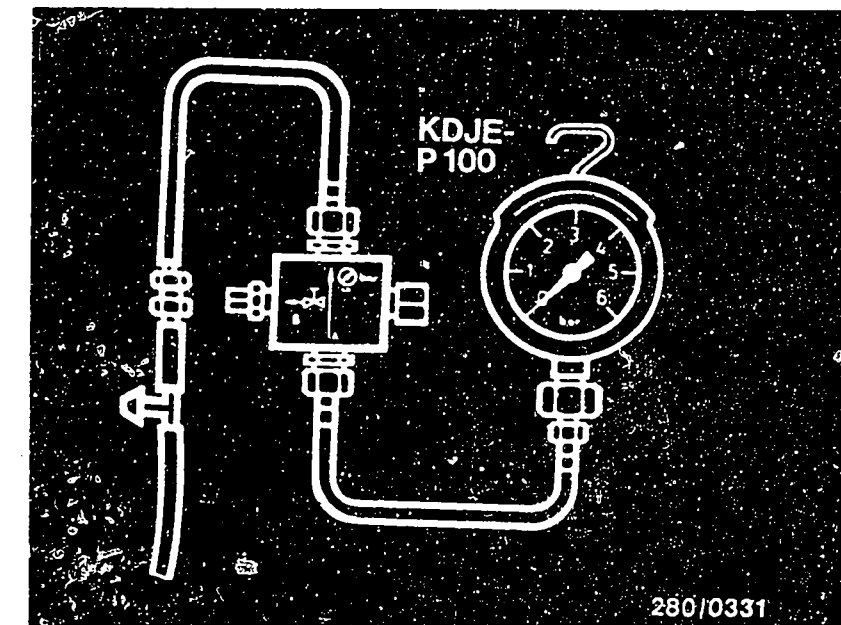
Fiat 132/Argenta
2.8...3.2 bar

Fiat Spider 2000 US
2.3...2.7 bar

Let engine idle → fuel pump pressure approx. 2.5 bar (132/Argenta) and 2.0 bar (Spider 2000 US).

Yes

Continued on K3/K4



K1

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



K2

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



No maximum engine power, top speed not reached (continued)

Fuel pressure O.K.?

Test specification
1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Pressure regulator O.K.?
Test specification reached?

No

Testing the pressure regulator

Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close).
Electric fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta

2.8...3.2 bar

Fiat Spider 2000 US

2.3...2.7 bar

Fuel pressure of 2.8 bar (132/Argenta) or
2.3 bar (Spider 2000 US) not reached:

1. Slowly pinch off fuel return line:

(Caution: Do not load pressure gauge
above 6 bar).

Pressure rises above 4 bar → replace
pressure regulator.

Pressure remains below 4 bar → replace
fuel pump.

2. Check fuel delivery line and fuel filter
for throughflow.

3. Strainer in tank clogged.

4. Corrosion in tank.

Fuel pressure of 3.2 bar (132/Argenta) or
2.7 bar (Spider 2000 US) exceeded:

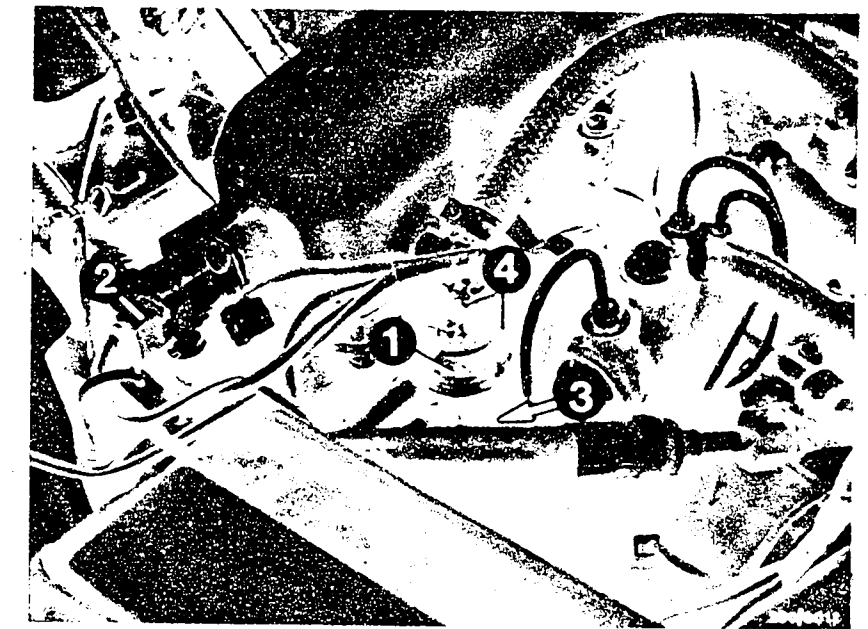
1. Fuel return line clogged or pinched.

2. Replace pressure regulator.

Fit hose between air filter and air-flow
sensor and tighten hose clamp (leaks).

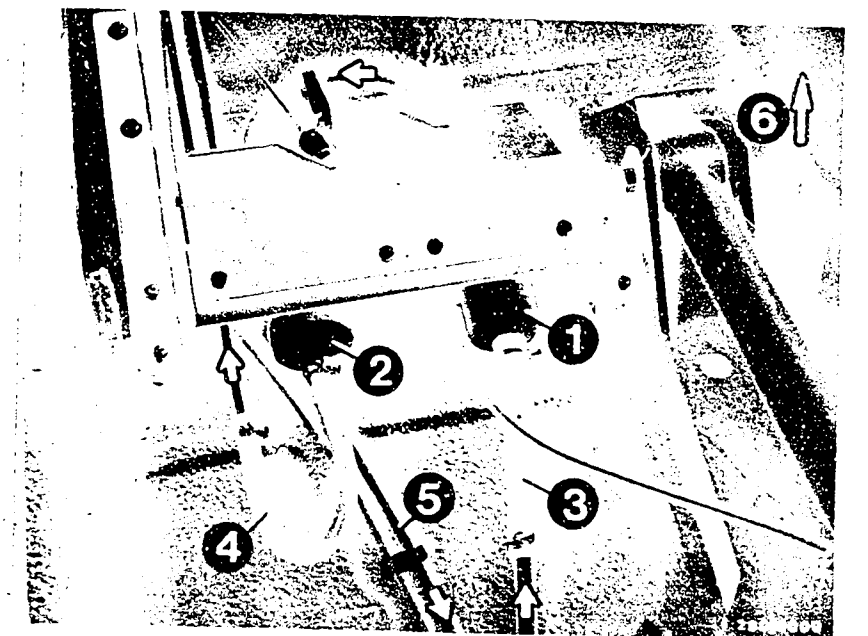
Yes

Continued on K5/K6



1 = Pressure regulator
3 = Fuel return line

1 = Electric fuel pump
2 = Fuel filter
3 = Fuel inlet line
4 = Fuel delivery line
5 = Fuel return line
6 = Forwards travel
Arrow: Direction of fuel return



K3

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



K4

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



No maximum engine power, top speed not reached (continued)

Fuel delivery
O.K.?

No

Measuring the fuel delivery.

For testing, undo the junction between the fuel return hose (from pressure regulator) and fuel return line (to fuel tank). If necessary, extend hose and lead into a 5 l vessel with graduated scale. Remove air hose to air filter on air-flow sensor. Open air-flow sensor flap by hand until pump operates.

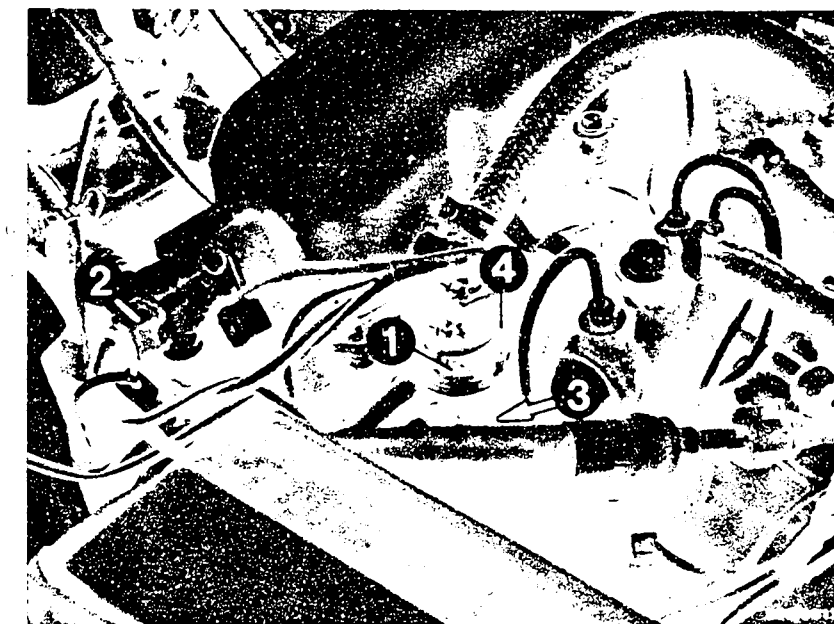
Test specification: min. 675 cm³/30 s

Remedy if test specification not reached:

- Fuel filter clogged → replace
- Voltage at fuel pump plugs, with engine running min. 12 V → clean contacts; possibly also eliminate poor ground connection; replace leads.
- Fuel pressure regulator defective → replace
- Fuel pump delivery too low → replace fuel pump.

Fit hose between air filter and air-flow sensor and tighten hose clamp.

Yes



1 = Pressure regulator
3 = Fuel return line

Continued on K7/K8

K5

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



K6

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



No maximum engine power, top speed not reached (continued)

Air-flow sensor O.K.?

Yes

No

Testing:

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohm-meter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect sensor flap (remove hose between air filter and air-flow sensor).

Test specifications:

0 280 202 017

(with code number
5 or 8):

100...500 Ω

0 280 202 017 and

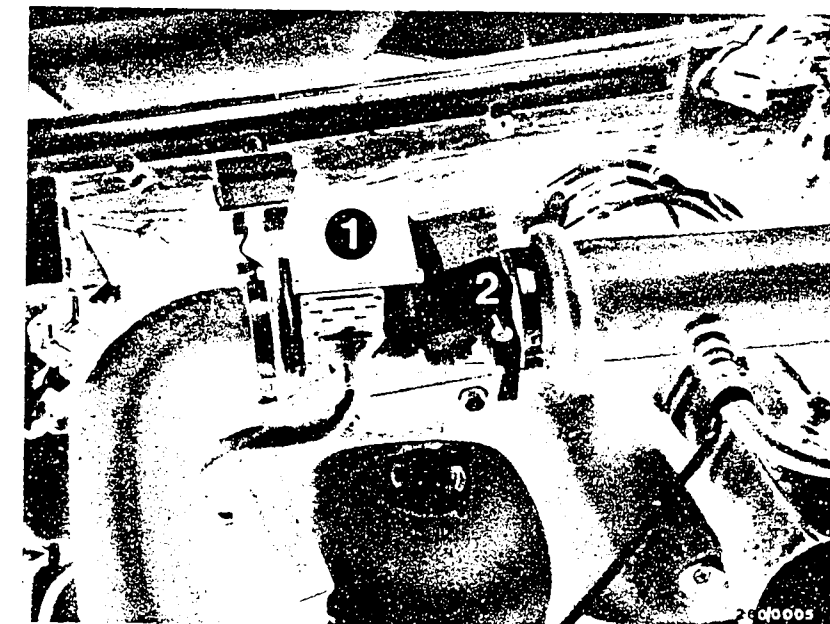
0 280 202 019...23

(with code number 21):

200...1000 Ω

Caution!

When the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight (leaks).

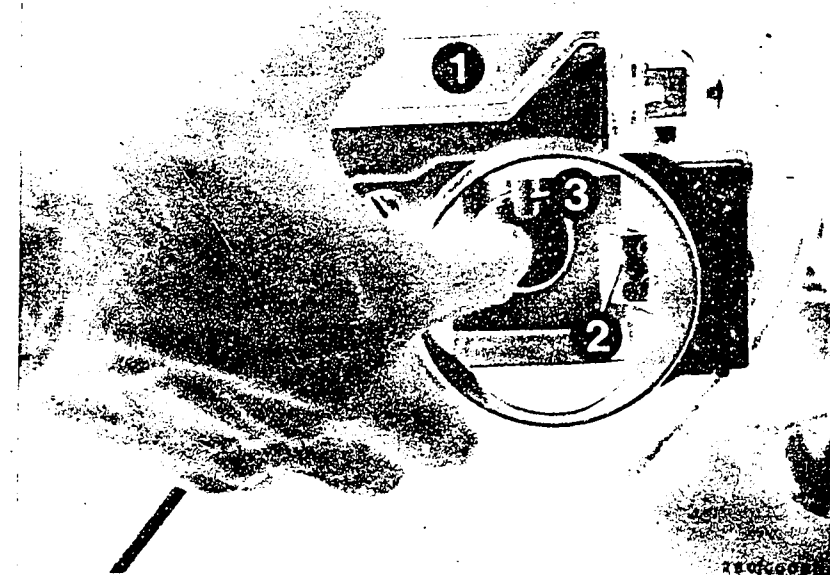


1 = Air-flow sensor

2 = Bypass screw
(CO adjustment)

Turning in clockwise direction =
richer mixture

Pushing open the air-flow sensor
flap



Continued on K9/K10

K7

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



K8

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



No maximum engine power, top speed not reached (continued)

Are all hose lines and electric leads securely attached? Visual examination. Is the air-intake system leak-tight?

No

Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked, or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak. Check electric contacts for loose connection.

Yes

Testing completed for customer complaint

"No maximum engine power".

Customer complaint remedied?

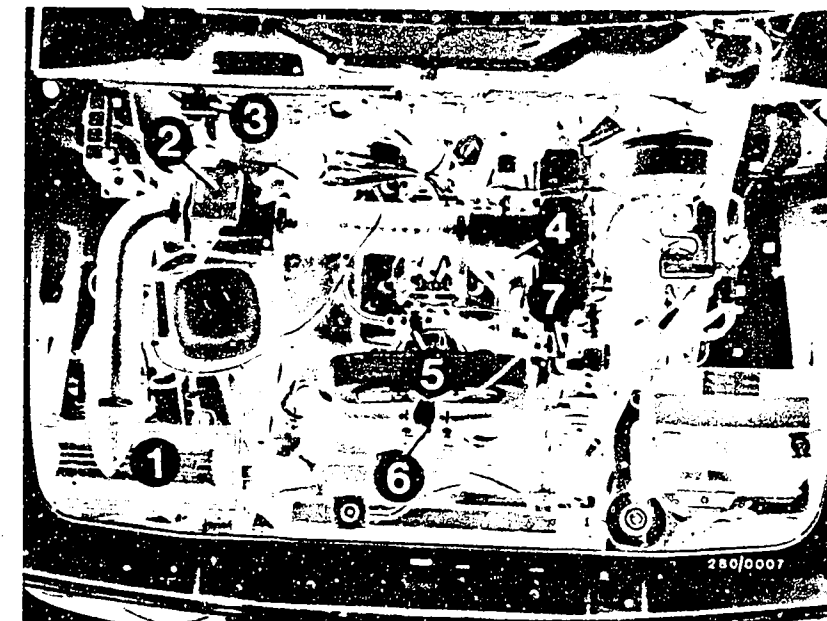
No

Further possibilities:

- Customer complaint incorrectly diagnosed.

If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).

- Engine not mechanically O.K. (Compression, valve setting, valve timing, worn camshaft).



Overall view of engine

- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Relay set
- 4 = Throttle-valve switch
- 5 = Auxiliary-air device (black plug)
- 6 = Temperature sensor II (white plug)
- 7 = Start valve (blue plug)

K9

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



K10

No maximum engine power

Fiat 132/Argenta/Spider 2000 US



Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

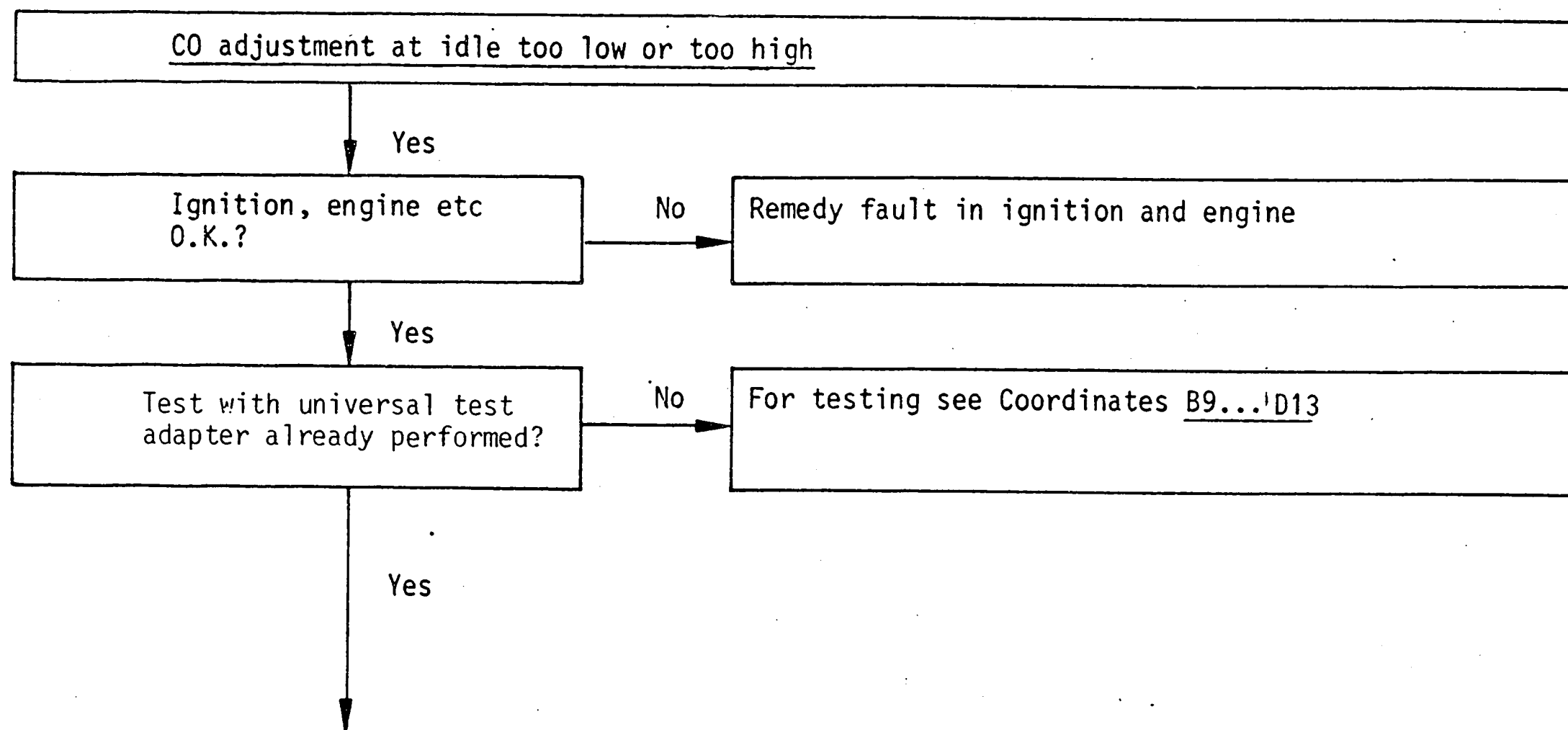
The program is divided into three rows of boxes:

1. The left-hand row contains the questions on the tests.
2. The middle row contains descriptions of the testing and adjustment operations on the components.
3. The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row and carry out the tests given there.

When you have finished testing, continue trouble-shooting at the point at which you branched off.



Continued on K13/K14

K11

CO adjustment

Fiat 132/Argenta/spider 2000 US



K12

CO adjustment

Fiat 132/Argenta/Spider 2000 US



CO adjustment at idle too low or too high (continued)

CO and idle speed correctly adjusted?

No

CO and idle adjustment

Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted transmission:

$800 \dots 900 \text{ min}^{-1}$

Automatic transmission (selector lever in position "D" and hand-brake on):

$700 \dots 800 \text{ min}^{-1}$

CO setting for Fiat 132/Argenta:

$1.5 \dots 2.5 \%$ by vol. CO

CO setting for Fiat Spider 2000 US

(Lambda sensor disconnected):

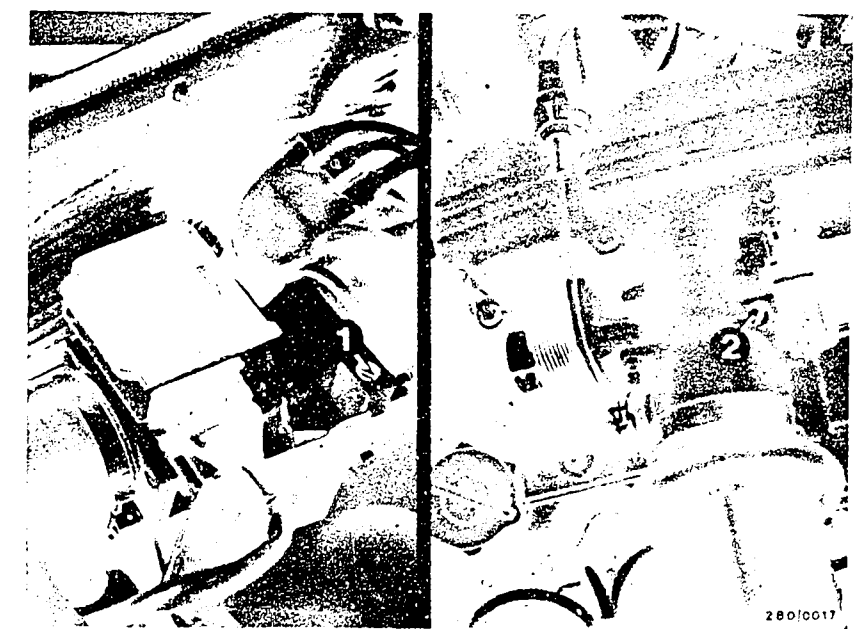
Max. 0.8% by vol. CO

Let warmed-up engine idle with the air conditioner (if fitted) switched off. Connect connecting leads on solenoid-operated air valve to battery voltage. Engine speed is increased by approx. 150 min^{-1} . If there is no change in engine speed, replace the solenoid-operated air valve. If CO concentration too high, turn bypass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction. Check engine speed and CO concentration again. Carry out adjustments in several steps. After adjusting, use new plugs.

Can idle speed not be adjusted?

Yes

Continued on K15/K16

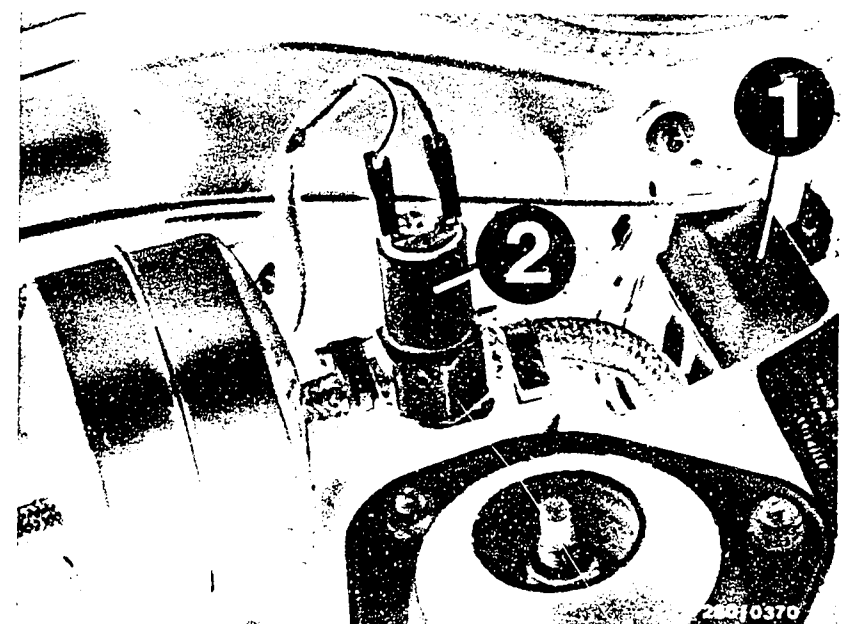


1 = CO adjusting screw

2 = Idle-speed-adjusting screw

1 = Relay set

2 = Solenoid-operated air valve



K13

CO adjustment

Fiat 132/Argenta/Spider 2000 US



K14

CO adjustment

Fiat 132/Argenta/Spider 2000 US



CO adjustment at idle too low or too high (continued)

Air-flow sensor O.K.?

No

Testing: Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect sensor flap (remove hose between air filter and air-flow sensor).

Test specifications: 0 280 202 017 (with code number 5 or 8): 100...500 Ω

0 280 202 017 and 0 280 202 019...23 (with code number 21): 200...1000 Ω

Caution! When test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure that hose clamp is tight. (Leaks).

Yes

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

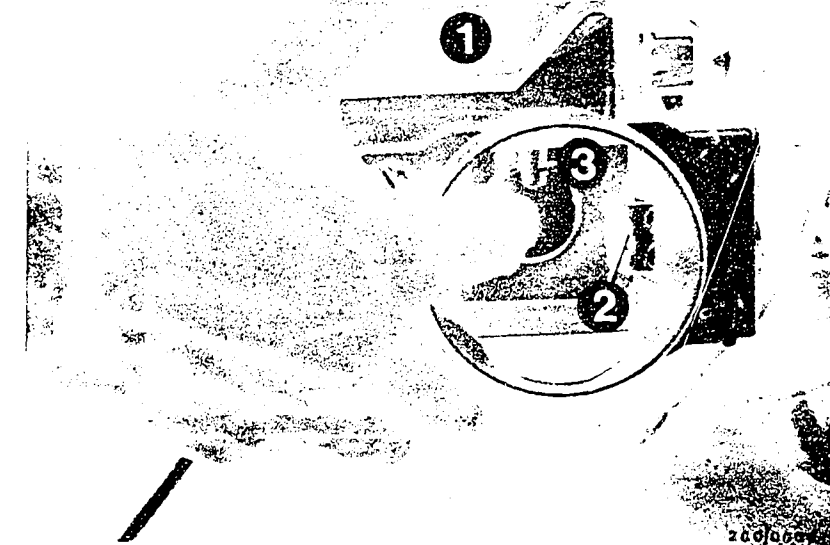
No

Testing: Remove hose from fuel delivery line. Connect pressure gauge.

Caution: When removing the fuel hose make sure that no fuel gets onto hot parts of the engine.

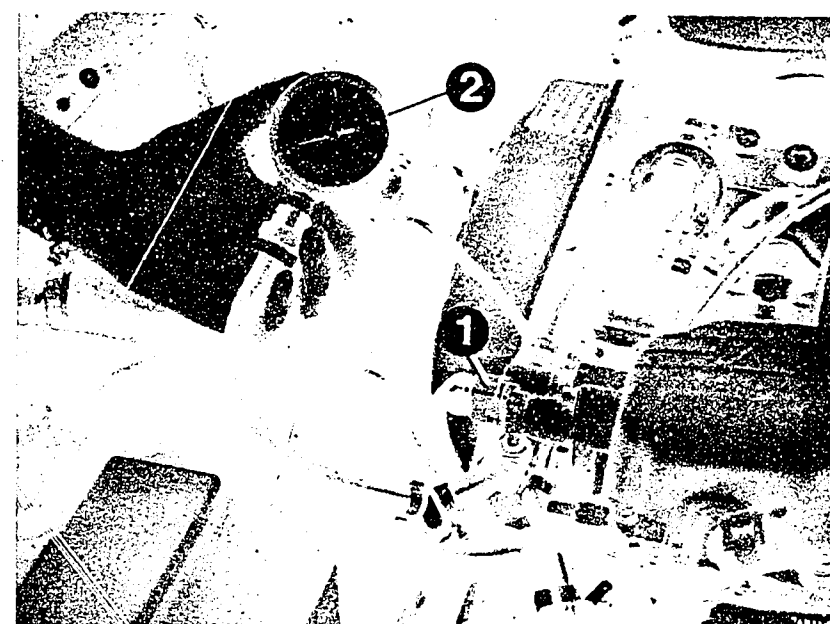
Yes

Continued on K17/K18



Pushing open the air-flow sensor flap

1 = Start valve
2 = Pressure gauge



K15

CO adjustment

Fiat 132/Argenta/Spider 2000 US



K16

CO adjustment

Fiat 132/Argenta/Spider 2000 US



CO adjustment at idle too low or too high (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Test specification reached?

No

Testing the fuel pressure

Connect the connections of the pressure testers into the fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw. Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the fuel-distribution pipe. Make sure there are no leaks. Switch on ignition. Remove hose between air filter and air-flow sensor. Deflect air-flow sensor flap slightly (pump contact must close). Fuel pump must operate.

Fuel pressure

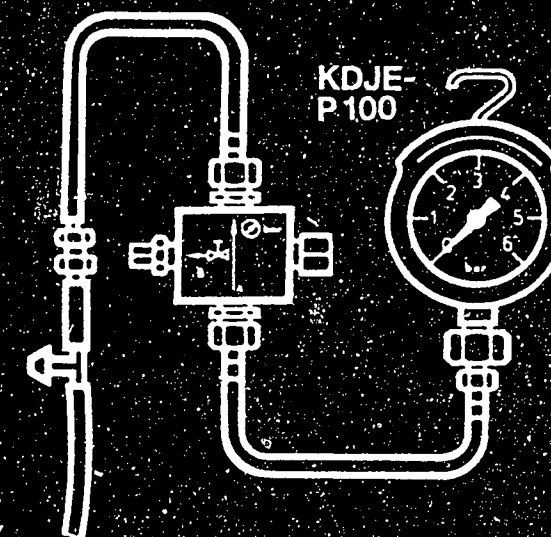
Fiat 132/Argenta
2.8...3.2 bar

Fiat Spider 2000 US
2.3...3.7 bar

Let engine idle → fuel pump pressure approx. 2.5 bar (132/Argenta) and 2.0 bar (Spider 2000 US).

Yes

Continued on K19/K20



280/0331



280/0332



1687 231 154

280/0333

K17

CO adjustment

Fiat 132/Argenta/Spider 2000 US



K18

CO adjustment

Fiat 132/Argenta/Spider 2000 US



CO adjustment at idle too low or too high (continued)

Fuel pressure O.K.?

Test specification

1. Fiat 132/Argenta
2.8...3.2 bar

2. Fiat Spider 2000 US
2.3...2.7 bar

Pressure regulator O.K.?
Test specification reached?

No

Yes

Continued on K21/K22

Testing the pressure regulator

Switch on ignition. Deflect air-flow sensor flap slightly (pump contact must close).
Electric fuel pump must operate.

Fuel pump pressure

Fiat 132/Argenta
2.8...3.2 bar
Fiat Spider 2000 US
2.3...2.7 bar

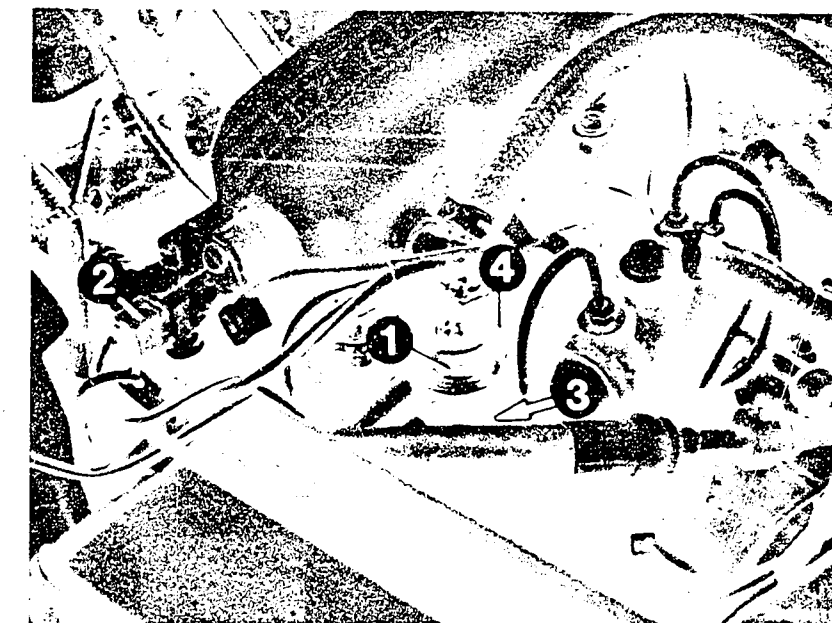
Fuel pressure of 2.8 bar (132/Argenta) or
2.3 bar (Spider 2000 US) not reached:

1. Slowly pinch off fuel return line:
(Caution: Do not load pressure gauge above 6 bar).
Pressure rises above 4 bar → replace pressure regulator.
Pressure remains below 4 bar → replace fuel pump.
2. Check fuel delivery line and fuel filter for throughflow.
3. Strainer in tank clogged.
4. Corrosion in tank.

Fuel pressure of 3.2 bar (132/Argenta) or
2.7 bar (Spider 2000 US) exceeded:

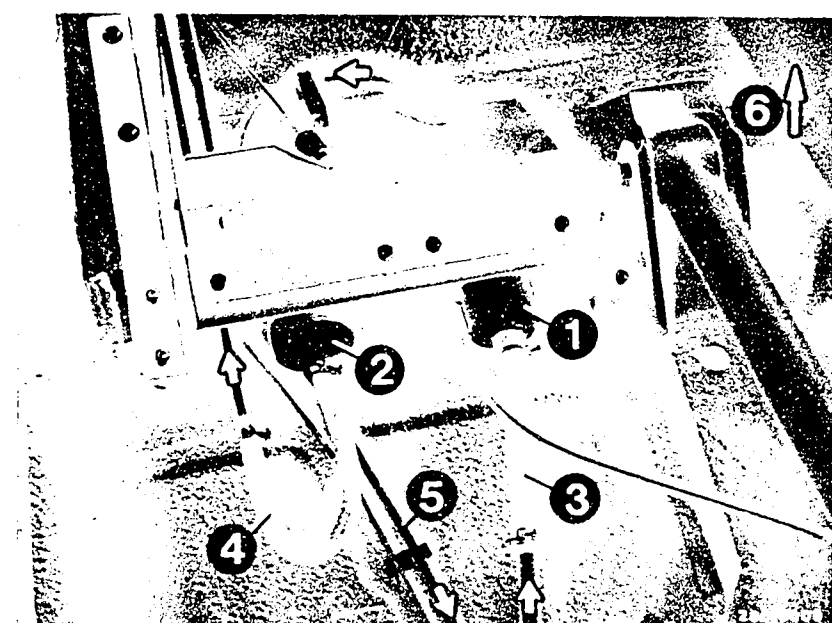
1. Fuel return line clogged or pinched.
2. Replace pressure regulator.

Fit hose between air filter and air-flow sensor and tighten hose clamp (leaks).



1 = Pressure regulator
3 = Fuel return line

1 = Electric fuel pump
2 = Fuel filter
3 = Fuel inlet line
4 = Fuel delivery line
5 = Fuel return line
6 = Forwards travel
Arrow: Direction of fuel return



K19

CO adjustment

Fiat 132/Argenta/Spider 2000 US



K20

CO adjustment

Fiat 132/Argenta/Spider 2000 US



CO adjustment at idle too low or too high (continued)

CO concentration below tolerance?

Fiat 132/Argenta:
max. 2.5 % by vol. CO

Fiat Spider 2000 US
max. 0.8 % by vol. CO

Temperature sensors
O.K.?

Start valve leak-tight?

No

Testing the temperature sensor:

Using ohmmeter, make direct resistance measurement at temperature sensor II (engine). Resistance measurement at term. 13 and term. 49 (ground);

at ambient temperature
(approx. 15...30°C): 1.3...3.6 kΩ

with engine at normal operating temperature
(approx. 80°C): 250...390 Ω

If incorrect, check for open circuit or short circuit in following leads using ohmmeter: Multiple plug term. 13 to temperature sensor II term. 13 and temperature sensor II term. 49 to central ground (lead 49). Check all contacts in the plug-in connections.

Testing the start valve for leaks:

1. When installed

Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.

2. When removed

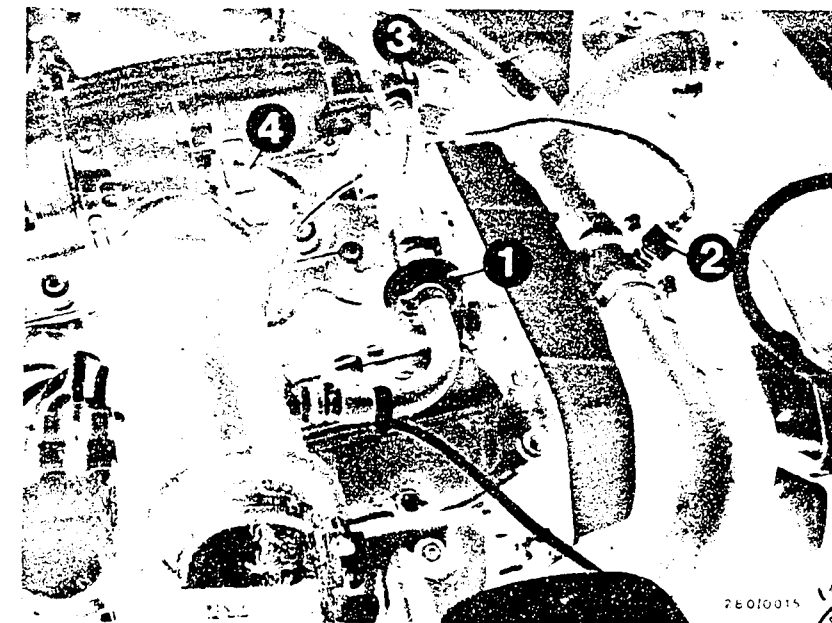
Remove start valve (Caution! Fire Hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (remove hose between air filter and air-flow sensor. Ignition "ON" and deflect air-flow sensor flap).

Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Caution! After the test is completed, the hose between air filter and air-flow sensor must be fitted again. Make sure the hose clamp is tight.

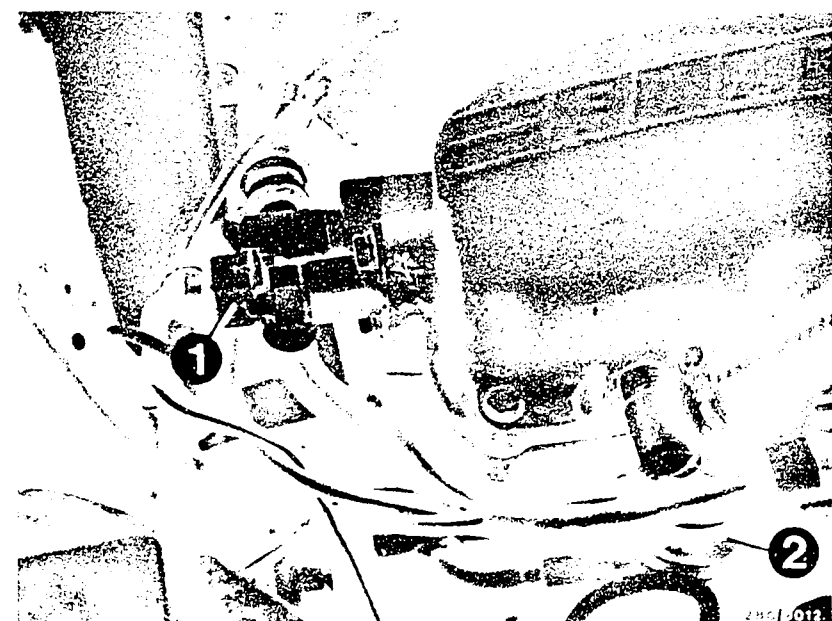
Yes

Continued on K23/k24



2 = Temperature sensor II
(engine)

1 = Start valve



K21

CO adjustment

Fiat 132/Argenta/Spider 2000 US



K22

CO adjustment

Fiat 132/Argenta/Spider 2000 US



CO adjustment at idle too low or too high (continued)

CO concentration above tolerance?

Fiat 132/Argenta:
1.5 % by vol. CO

Fiat Spider 2000 US
0.8 % by vol. CO

Air-intake system
leak-tight?

No

Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Remove hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Yes

Testing completed
for customer
complaint

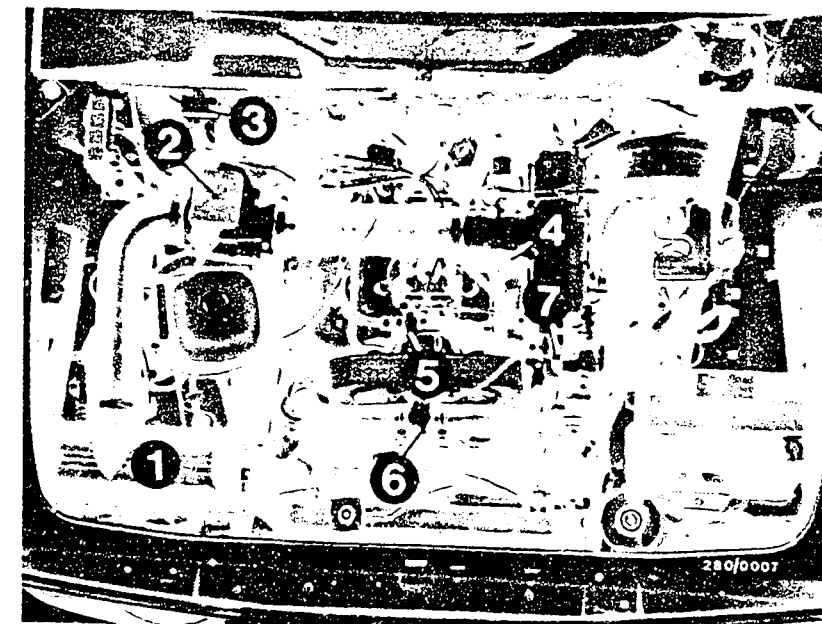
"CO-Setting".

Customer complaint
remedied?

No

Further possibilities

- Customer complaint incorrectly diagnosed.
(see coordinates B3...B8)
If the fault has not been detected by
"direct trouble-shooting", see "detailed
trouble-shooting" (see coordinates B3 - B8).
- Engine not mechanically O.K.
(Compression, valve setting, valve timing,
worn camshaft).



Overall view of engine

- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Relay set
- 4 = Throttle-valve switch
- 5 = Auxiliary-air device
(black plug)
- 6 = Temperature sensor II
(white plug)
- 7 = Start valve
(blue plug)

K23

CO adjustment

Fiat 132/Argenta/Spider 2000 US



K24

CO adjustment

Fiat 132/Argenta/Spider 2000 US



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FIAT 132 2000 i
with L-Jetronic

VDT-I-FIA 017 En
1.1980

Since Autumn 1979 FIAT have been delivering type 132 - 2000 i (Iniezione) for Europe with 2.0 l 4-cylinder engine equipped with L-Jetronic and breakerless transistorized ignition system. Output 90 kW (122 HP).

L-Jetronic

The components used in the L-Jetronic will already be familiar from other L-Jetronic systems.

Control unit	0 280 000 174
Air-flow sensor	0 280 202 017
Injection valve	0 280 150 121
Electric fuel pump	0 580 464 019

Breakerless transistorized ignition

The ignition system is delivered complete from Marelli.

Ignition point: At idle 10° BTDC without vacuum.

Idle speed: manually-shifted transmission 850 min^{-1}
automatic 750 min^{-1}

Technical documentation

Equipment:

on microfiche

Trouble-shooting chart for
L-Jetronic with analog tester:

VDT-W-280/515 En

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Motor Vehicle Service Information

Fiat 132/Argenta/Spider 2000 US



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EXPORT VEHICLES WITH
EMISSION CONTROL SYSTEMS

VDT-I-Gen. 042 En.
12. 1981

K-Jetronic and L-Jetronic

Export vehicles for countries with stringent exhaust emission regulations are equipped with various emission control systems. To meet the legal requirements, these systems are installed either individually or in combination, depending on the model version.

Emission control system	installed predominantly in export vehicles				
	Sweden	Australia	Canada	USA	Japan
Exhaust-gas recirculation*	•	•	•	(•)	(•)
Secondary-air induction*	•	•	•	(•)	(•)
Secondary-air injection*	•	•	•	(•)	(•)
Catalytic converter*	-	-	-	•	•
Lambda closed-loop control	-	-	-	•	•

The vehicle-related After-Sales Service Instruction Manuals for the K-Jetronic and L-Jetronic describe the construction, function and operating principle of the emission control systems. The influence of these systems should be borne in mind particularly when adjusting the idle speed and CO concentration.

Export vehicles are sometimes also encountered in countries which do not have particularly stringent exhaust emission legislation. This Service Information publication summarizes the various emission control systems and provides information for the After-Sales Service in countries with exhaust emission legislation which does not require such emission control systems or unleaded fuel.

* Not made by Bosch

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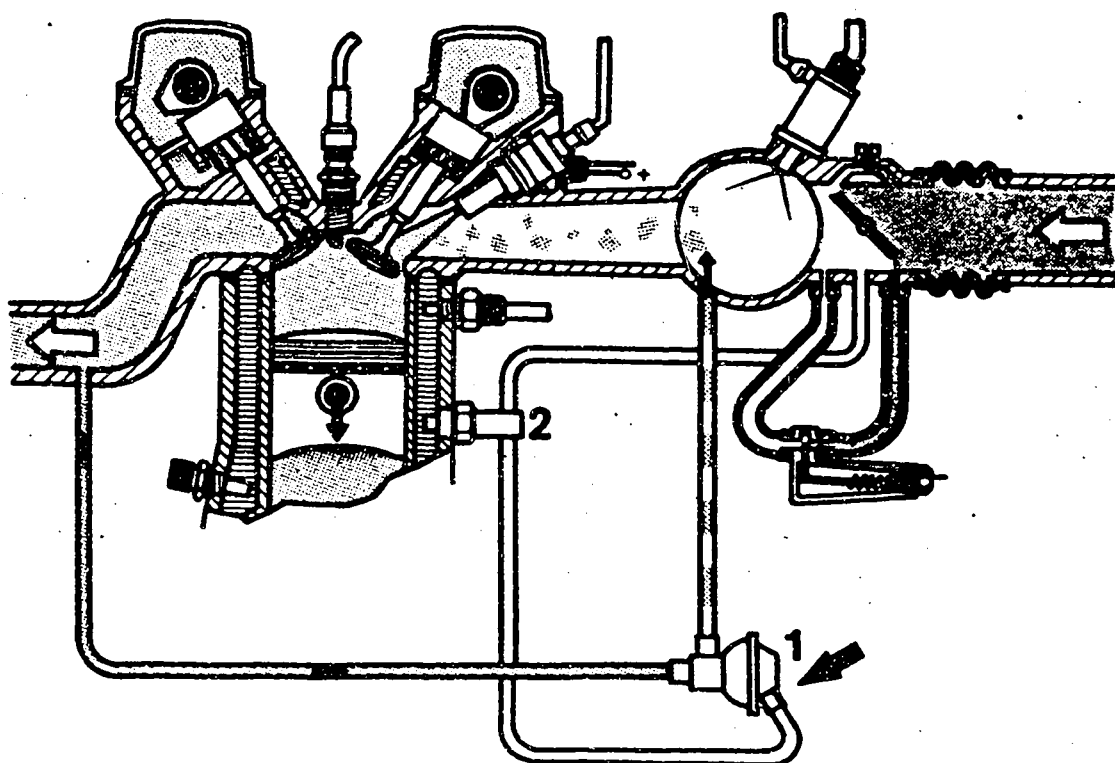
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1. Exhaust-gas recirculation (EGR)



1 = Exhaust-gas recirculation valve 2 = Thermo-valve

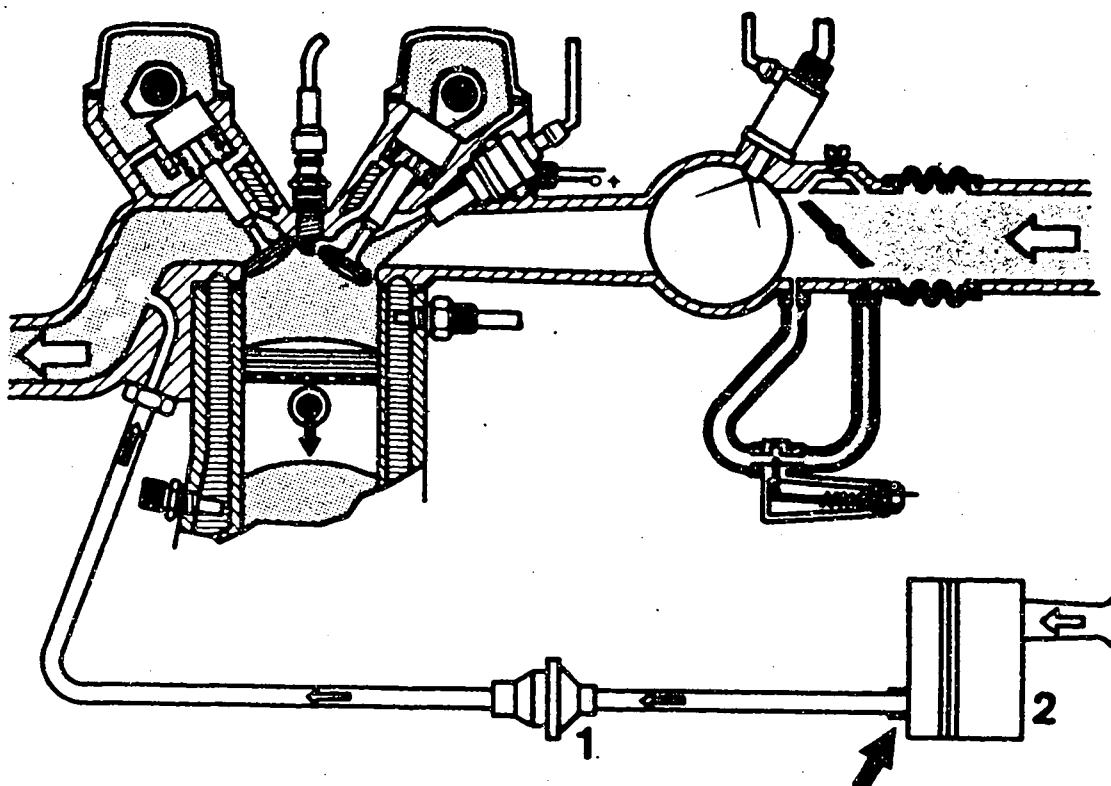
Some of the exhaust gas is returned to the intake manifold via a vacuum-controlled exhaust-gas recirculation valve. This recirculation of exhaust gas into the combustion chamber lowers the combustion temperature and reduces the emission of nitrogen oxides (NOx). The thermo-valve and the position of the vacuum tapping port on the throttle-valve assembly ensure that exhaust gas is only recirculated when the engine is warm and only at part load. There is a reduction in engine speed of about 200 min⁻¹. Exhaust-gas recirculation is inoperative at idle, full-load and when the engine is cold.

When testing or adjusting the idle speed and CO concentration, remove and seal off the vacuum control line (arrow) on the exhaust-gas recirculation valve in order to ensure that the exhaust-gas recirculation system is inoperative.

In countries without stringent exhaust emission legislation it is not necessary to shut down the system.



2. Secondary-air induction (e.g. Volvo Pulsair system)



1 = Non-return valve

2 = Air filter

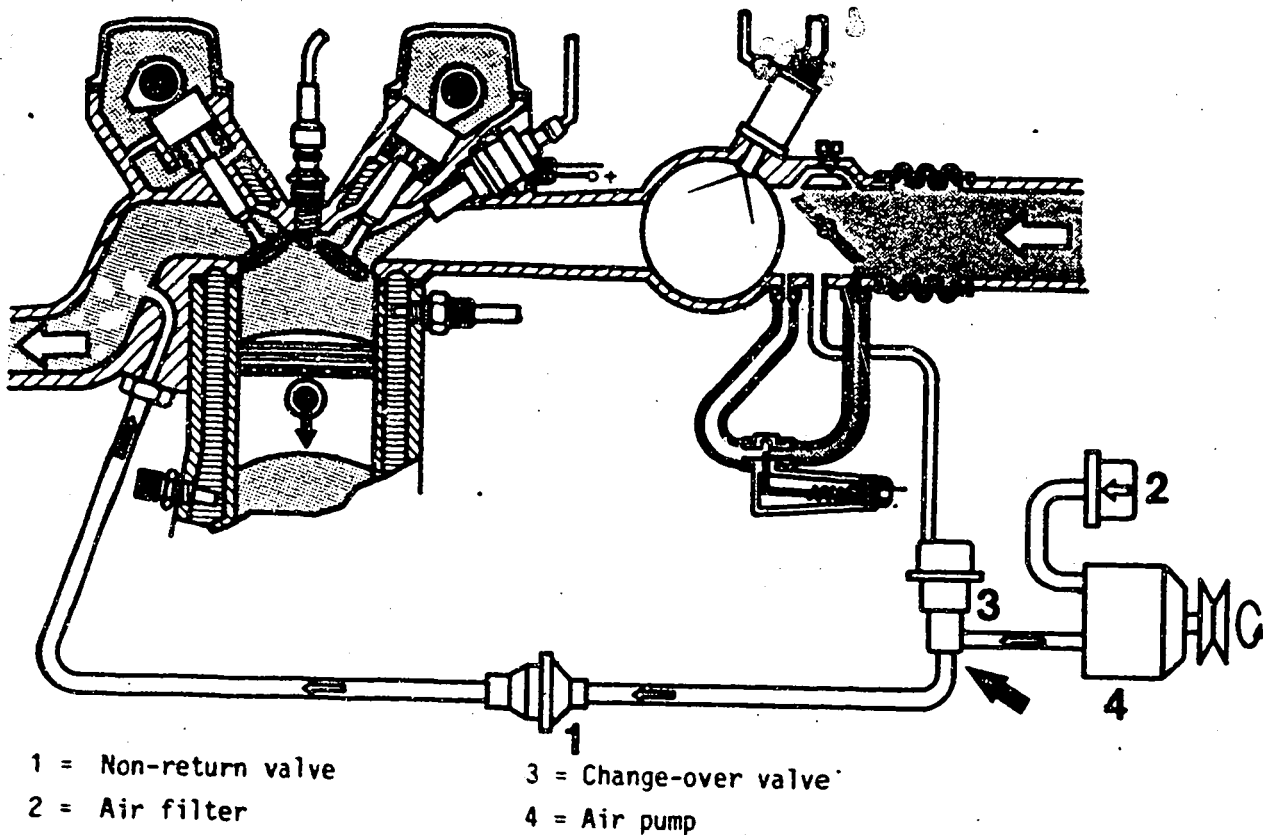
The pulsating alternation between overpressure and depression in the flow of exhaust gas inducts fresh air into the exhaust ports via a non-return valve. Unburned residues of carbon monoxide (CO) and hydrocarbons (HC) are partially after-burned, leading to fewer pollutants in the exhaust gas.

When testing or adjusting the idle speed and the CO concentration, the secondary-air induction system must be rendered inoperative. To do this, remove the hose between the non-return valve and the air filter on the air filter (arrow) and seal off tight with a plug.

In countries without stringent exhaust emission legislation it is not necessary to shut down the secondary-air induction system.



3. Secondary-air injection



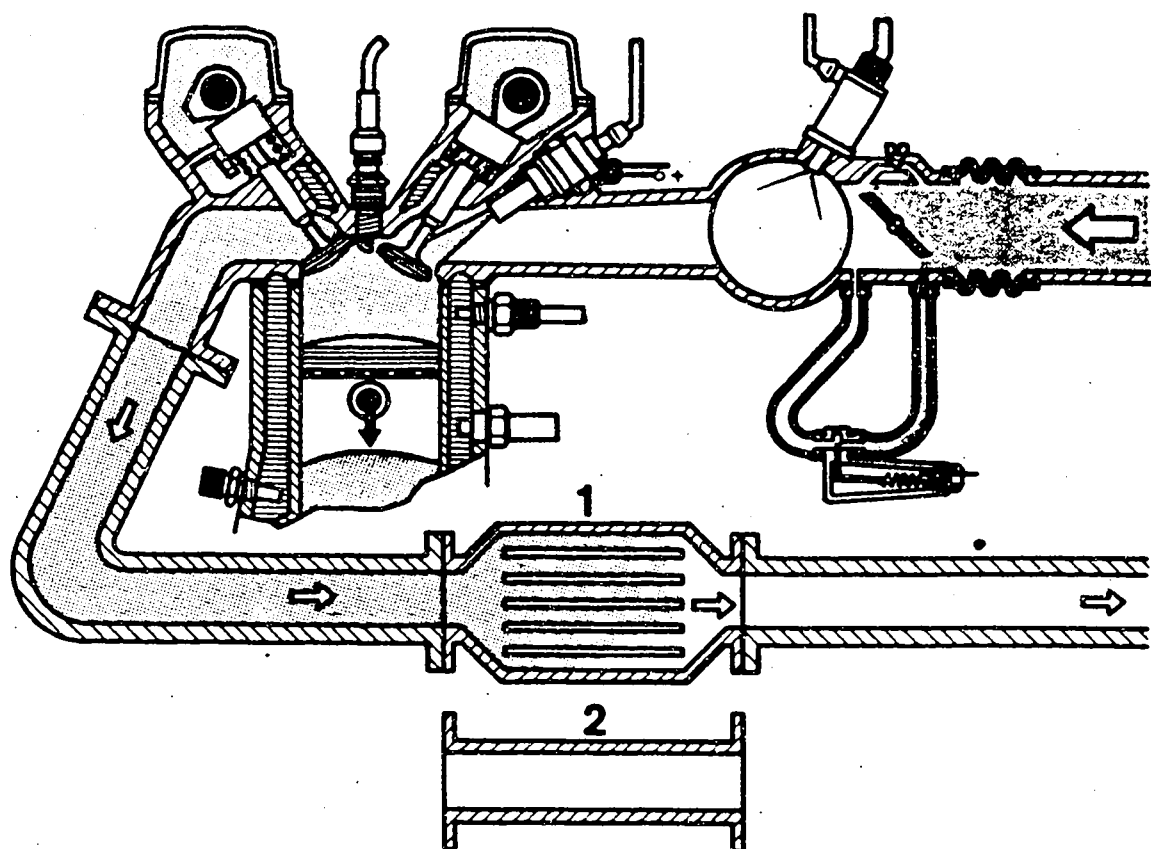
An air pump driven by the engine inducts fresh air through the air filter and forces it via a non-return valve into the exhaust ports. As in the case of secondary-air induction, there is a partial after-burning of the CO and HC residues. This makes the exhaust gas cleaner. A vacuum-controlled change-over valve controls the operation of the secondary-air injection system.

When testing or adjusting the idle speed and the CO concentration, shut down the secondary-air injection system. To do this, remove the hose from the outlet of the change-over valve (arrow) and seal off tight with a plug.

In countries without stringent exhaust emission legislation it is not necessary to shut down the secondary-air injection system.



4. Catalytic converter



1 = Catalytic converter

2 = Intermediate pipe

The single-bed catalyst installed in the exhaust system in export vehicles (also with lambda closed-loop control) reduces all three pollutants CO, HC and NO_x to a minimum. The catalytic surface triggers chemical reactions of the pollutants, rendering them non-toxic.

Important: Proper operation only possible in conjunction with unleaded fuel (at present only in USA and Japan).

When testing or adjusting the idle speed and the CO concentration, the catalytic converter can be neglected since the exhaust-measuring point is upstream of the catalyst.

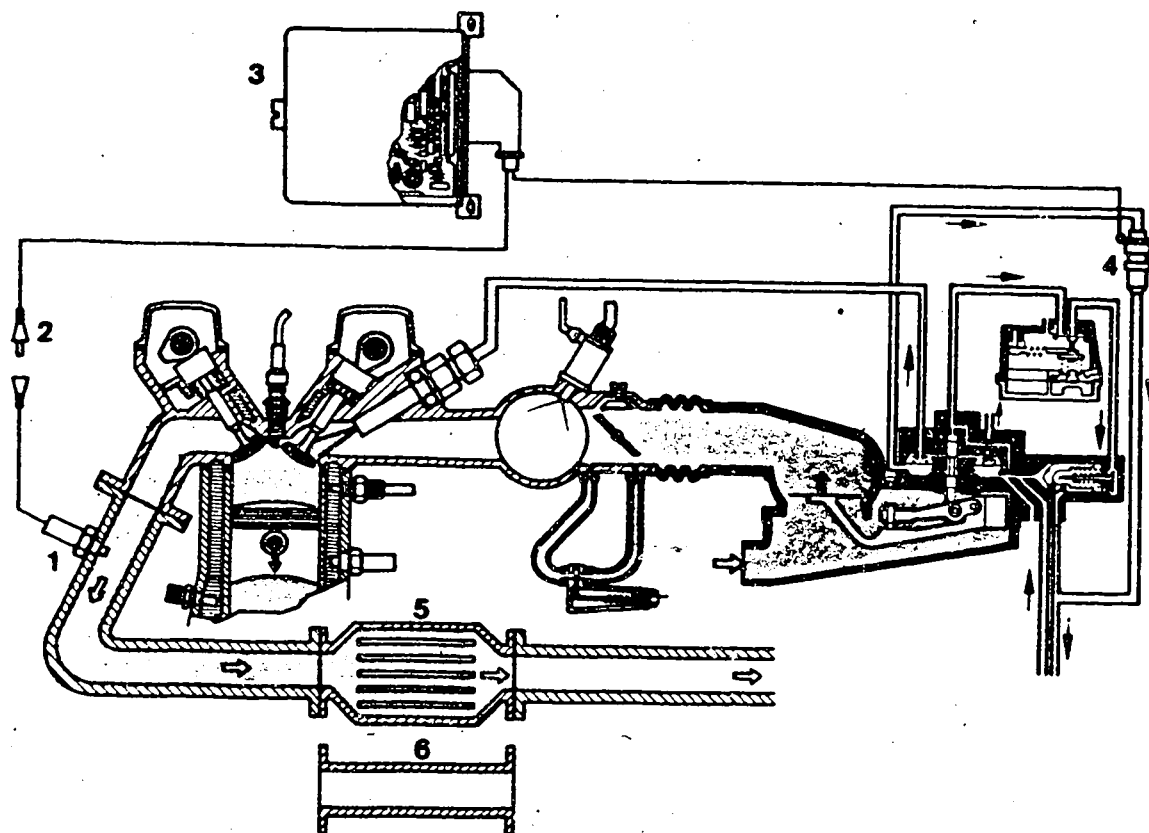
Caution!

If the vehicle is operated on leaded fuel (predominantly in countries without stringent exhaust emission legislation) the catalytic converter must be removed. If not removed, the catalytic converter would become clogged up and lead to a reduction in the power output of the engine.

Appropriate intermediate pipes for converting the exhaust system are available from the vehicle manufacturer.



5. Lambda closed-loop control



1 = Lambda sensor
2 = Plug

3 = Control unit
4 = Timing valve

5 = Catalytic converter
6 = Intermediate pipe

Export vehicles for the USA and Japan are equipped with lambda closed-loop control. This additional function of the K-Jetronic or L-Jetronic is not a downstream emission control system, but ensures a low pollutant content in the exhaust gas by means of optimum mixture preparation. Additional exhaust-gas recirculation, secondary-air induction or secondary-air injection is therefore not necessary in most cases. Like the catalytic converter, the lambda sensor (in the exhaust gas) operates only with unleaded fuel.

If the vehicle is operated on leaded fuel, the lambda sensor becomes clogged up and ceases to operate. The control unit detects this and switches from closed-loop to open-loop control. The system then operates on a fixed air-fuel ratio in the same manner as a K-Jetronic or L-Jetronic without lambda-closed-loop control. Before operating on leaded fuel, the lambda sensor should be removed and the installation hole should be closed off with a screw plug M18x1.5 (length of thread max. 8.5 mm). The disconnected plug (2) of the sensor connecting cable should be insulated and fastened to a suitable place on the vehicle body.

Caution!

Under no circumstances must the control unit or the timing valve be shut down on the lambda closed-loop control of the K-Jetronic. The catalytic converter should be replaced by an intermediate pipe.

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After-sales Service

Motor Vehicle Service Information

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UNIVERSAL TEST ADAPTER

VDT-I-Gen. 1001 En
1.1982

1. Application

The multiplicity of different fuel-injection and ignition systems at present available on the market, as well as the advances in development which can be expected in the future, demand a new testing concept. In order to maintain the outlay for test equipment, and hence the costs, at a reasonable limit we have developed the universal test adapter.

The following systems can be tested using a test-adapter universal unit together with adapter leads suited to the system in question:

1.1 Systems which are already being fitted as series:

- L-Jetronic (1st generation)
- LE-Jetronic (2nd-generation L-Jetronic)
- Motronic (with the new connector designation, refer to the vehicle-specific instructions!)

1.2 Systems whose introduction is planned:

- Motronic with gearbox control
- KE-Jetronic
- Mono-Jetronic
- Electronic ignition system with ignition map (EZF)

2. Delivery dates and Part Numbers

Available as from 2.1982.

2.1 Universal test adapter (basic unit)

Part Number: 0 684 101 801

Designation: ETT 018.01

2.2 System adapter lead for LE-Jetronic (2nd-generation L-Jetronic)

Part Number 1 684 463 123

First application: For BMW 2.5/2.8 1 engines as from 9.1981, and for Opel 2.0 1 engines (Manta/Rekord) as from 9.1981.

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2.3 System adapter lead for Motronic with new connector assignment.

(Refer to the vehicle-related instructions!)

Part Number : 1 684 463 124

First application: Porsche 944 as from series production, BMW as from about 3.1982 (Europe)

2.4 System adapter lead for L-Jetrönic (in preparation)

Further system adapter leads will be made available along with the introduction of the new systems as mentioned above.

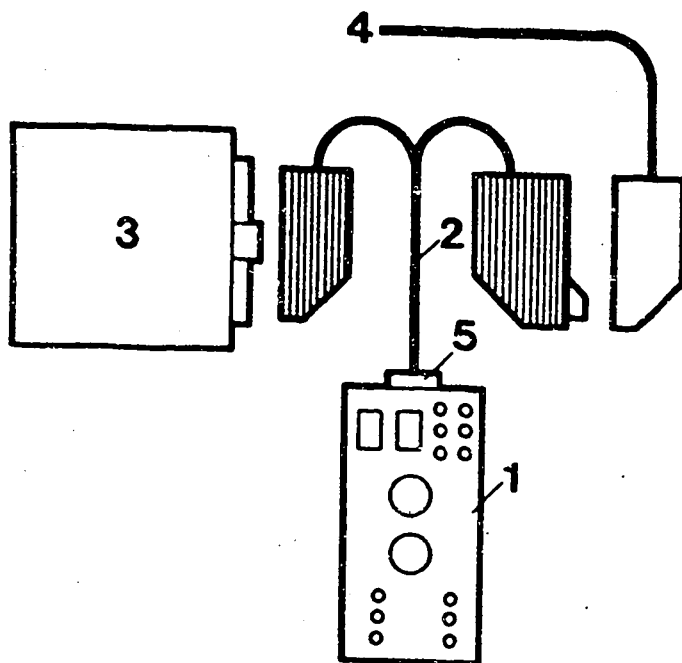
3. Testing procedure

The systems and the components are tested for voltage and resistance values as well as for correct functioning. Evaluation is by means of a multimeter and the Motortester which are connected into the universal test adapter.

Depending upon the complexity of the system, interchangeable adapter lead model 1 or model 2 is provided:

3.1 Adapter lead for peripheral and function testing (Model 1)

The universal test adapter together with the system adapter lead is to be connected to the system wiring harness and to the control unit (e.g. Motronic).
To be tested: Wiring harness with components and control unit.



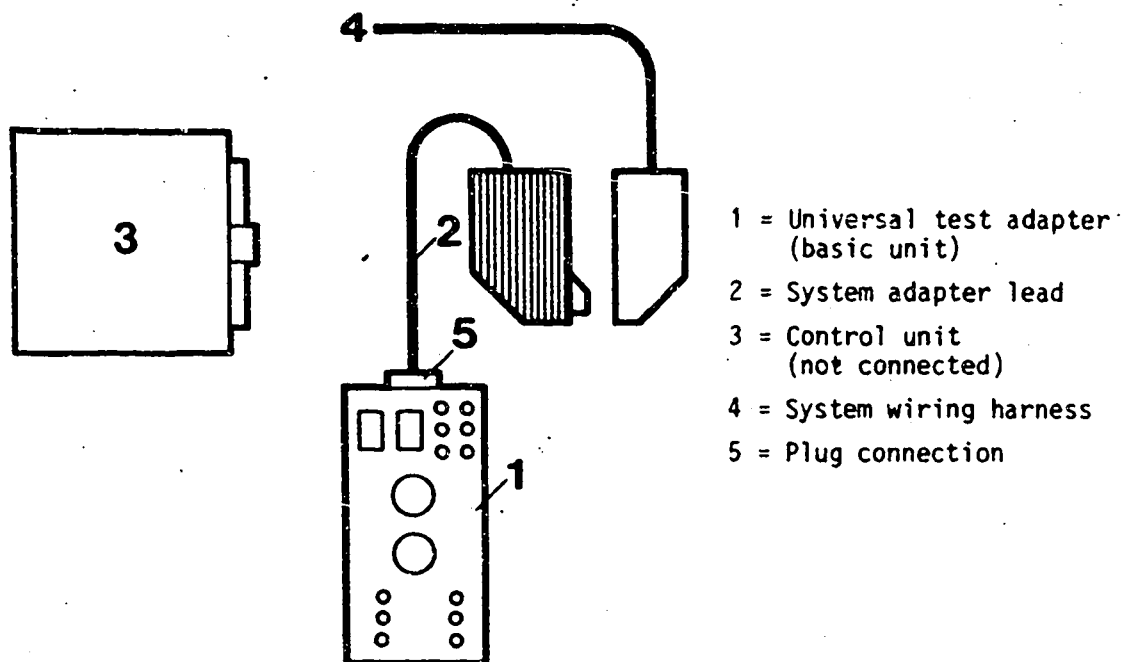
- 1 = Universal test adapter (basic unit)
- 2 = System adapter lead (Y-version)
- 3 = Control unit
- 4 = System wiring harness
- 5 = Plug connection



3.2 Adapter lead for peripheral testing (Model 2)

The universal test adapter with system adapter lead, is only to be connected to the system wiring harness (e.g. LE-Jetronic (2nd-generation L-Jetronic)).

To be tested: Wiring harness with components (without control unit).

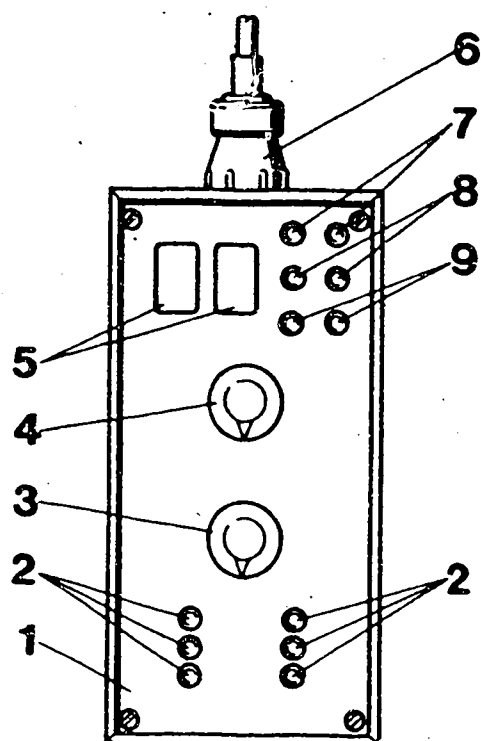


4. Construction of the universal test adapters

The universal test adapter is fitted with 2 program switches footlage and resistance measurement. The measured values are displayed on the multimeter connected to the universal test adapter. For reasons of safety, the voltage and resistance sockets are separated. In order to measure signals (e.g. injection pulses, ignition pulses), it is necessary to connect a Motortester to the measuring cavities (special input).

When carrying out functional tests with the control unit connected, selected push-buttons are pressed in a number of test-program steps in order to simulate a variety of different engine operating conditions the influence of which is evaluated using the Motortester.





- 1 = Universal test adapter (basic unit)
- 2 = Keyboard for simulation of various conditions e.g. engine temperature, throttle position etc.
- 3 = Program switch "Ohm" for resistance measurement
- 4 = Program switch "Volt" for voltage measurement
- 5 = Measurement "cavities" (for the special input from the Motortester)
- 6 = 63-pole plug-in connection for connecting the system adapter lead
- 7 = Measurement sockets (voltage measurement with a multimeter or with the Motortester)
- 8 = Measurement sockets (resistance measurement with the multimeter)
- 9 = Sockets for special functions (not yet allocated)

Notes:

1. The Motronic test adapter (0 684 101 800, ETT 018.00) will continue to be used for Motronic-equipped BMW vehicles (with old connector assignment) up to about year of manufacture 3.1982 (refer to vehicle-specific instructions).
2. Details on the operation of the universal test adapter, and the test specs, are to be found in the vehicle-specific after-sales service instructions.

3. Caution! Change of Part Number:

On the SIS-microfiches OPE-00/J22 (Coordinates A14 and A17) the new Part Numbers are as follows:

Universal test adapter: 0 684 101 801

Adapter lead : 1 684 463 123



After-sales Service

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CAR ALARM II, RETROFITTING
in vehicles equipped with L-Jetronic

VDT-I-280/103 En

7.1981

Supersedes Ed. 9.1980

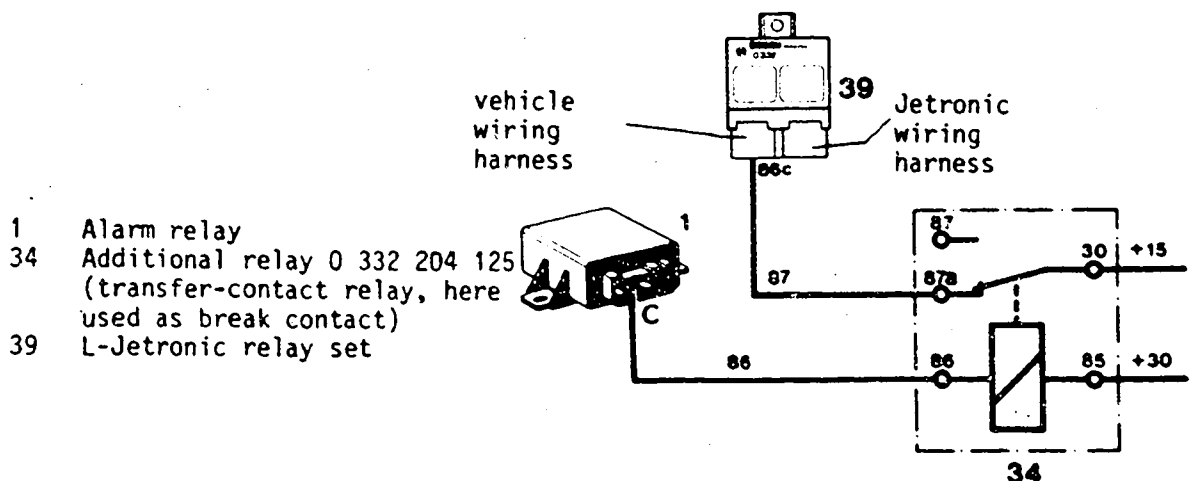
In cases where Car Alarm II (0 335 411 901) is retrofitted in vehicles equipped with L-Jetronic, the terminal 1 of the ignition coil must NOT be connected to terminal "C" of the alarm relay. When the Car Alarm is switched on, terminal "C" of alarm relay is switched internally to vehicle ground. This would mean that when attempts are made to start the vehicle with the alarm switched on, the ignition coil and the L-Jetronic control unit would be destroyed. This also means though, that full protection against theft is no longer possible as would normally be the case with the ignition switched off and with the alarm installation primed.

A circuit has now been developed which ensures complete theft protection for L-Jetronic vehicles as well.

Description of the circuit

Open-circuit the line "15" leading to terminal "86c" of the relay set using an additional relay (34) 0 332 204 125. This relay ensures that when the alarm installation is primed, the supply voltage to the control unit is switched off and hence the control unit no longer functions.

The additional relay (34) 0 332 204 125 is controlled by terminal "C" of the alarm relay (see circuit diagram).



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Technical Bulletin

Fiat 132/Argenta/Spider 2000 US



After-sales Service

Technical Bulletin

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NEW RELAY SET FOR L-JETRONIC

Connection sockets, danger of confusion

VDT-I-280/104 En

9.1980

New relay combinations 0 332 514 121, ..123, ..124, ..125 and ..127 with black plastic housing are being fitted in L-Jetronic equipped vehicles (e.g. BMW and FIAT).

With these new relay combinations, the two connection sockets can be accidentally confused with one another (for instance during test work). The safeguard pin previously fitted in terminal 88f of the Jetronic wiring harness socket of the relay combination 0 332 514 105 has been omitted and replaced by a "genuine" terminal 88f (see Figs. 1 and 2).

Fig. 1

Layout of the conductors in the connection socket of the relay combination 0 332 514 105 (top view)

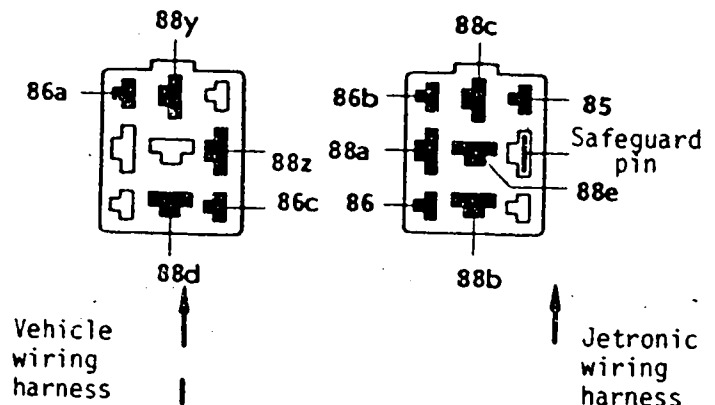
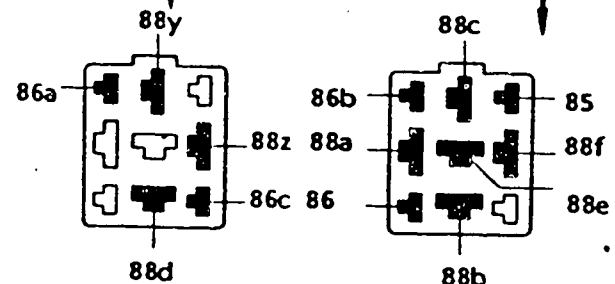


Fig. 2

Layout of the conductors in the connection socket of the relay combinations 0 332 514 121, ..123, ..124, ..125, ..127 (top view)



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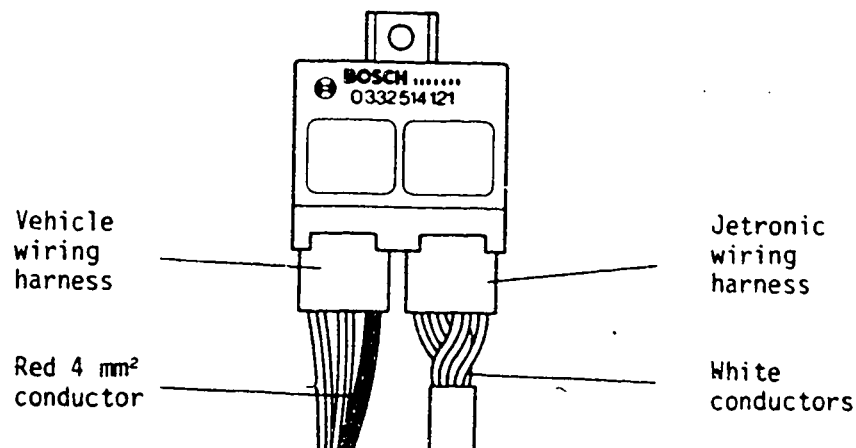


The connection sockets can also be identified in the following manner:

Vehicle wiring harness - connection socket is recognizable by the thick red conductor (4 mm²) leading to terminal 88Z. As viewed from above it is located on the left of the relay combination (see Fig. 3).

Jetronic wiring harness - connection socket is recognized by the white conductors. As viewed from above it is located on the right of the relay combination (see Fig. 3).

Note: With the wiring-harness sockets interchanged, the electric fuel pump starts to run as soon as the ignition is switched on.



With the introduction of the new relay combination, the resistance value between terminal 86b and 85 changes to 70 ... 500 Ω (L-Jetronic Tester, test step 3.1).

When testing with an ohmmeter, observe correct polarity.

Positive pole of the ohmmeter to terminal 86b.



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